The University of Chicago

COMMON STOCKS AND BONDS AS LONG-TERM INVESTMENTS

A DISSERTATION SUBMITTED TO THE FACULTY
OF THE SCHOOL OF BUSINESS IN CANDIDACY
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

1940

By
LEO SPURRIER

STUDIES IN BUSINESS ADMINISTRATION
Vol. XI, No. 2
THE UNIVERSITY OF CHICAGO PRESS
1941

STUDIES IN BUSINESS ADMINISTRATION

Volume XI • Number 2

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THE UNIVERSITY OF CHICAGO PRESS, CHICAGO

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TABLE OF CONTENTS

CHAPTER		PAGE
I.	Introduction	1
	A New Era in Investment Theory	1
	Different Types of Long-Term Security-Value Comparisons	2
	New Tests	3
	Purpose of the Study	3
II.	Historical Review of Previous Studies	4
III.	Method of Making Tests	18
	General Nature of the Tests	18
	Method of Selecting First Securities Used and of Making Security Substitutions	19
	Method of Computing the Investment Value of Stocks	22
	Method of Computing the Investment Value of Bonds	24
IV.	The Tests Made in the Present Study	25
	An Investment Test Should Favor Neither Stocks Nor Bonds	25
	When Does a Period of Time Favor Stocks or Bonds?	25
	Do the Tests of the Present Study Favor Stocks or Bonds?	28
	Results of Tests No. 1–16	29
V.	Different Types of Stocks as Long-Term Investments	51
	Comparative Investment Values of Different Types of Stocks	51
	The Effect of the Number of Securities on Investment Averages	60
VI.	Different Types of Bonds as Long-Term Investments	63
	The Comparative Investment Values of Different Types of Bonds	63
	The Effect of the Number of Securities on Investment Averages	72
VII.	Conclusion	73
	The Common Stock Theory	73
	The Effect of the Number of Securities on Investment Averages	77

PAGE

Comparative Investment Values of Different Types of Stocks 77
Common Stocks and Bonds as Investments: 1913–35 and 1923–35 79
Common Stocks as Investments: 1913–35 and 1923–35 . . 80
Bonds as Investments: 1913–35 and 1923–35 83
The Need for Scientific Study 85
The Common Stock Theory in the Future 87
Stocks and Bonds as Investments since 1935 88

BIBLIOGRAPHY 90

CHAPTER I

INTRODUCTION

A NEW ERA IN INVESTMENT THEORY

PERHAPS it would not be far from the truth to say that the year 1924 marked the beginning of a new era in the history of investment theory. It was in that year that Edgar Lawrence Smith's book, *Common Stocks as Long-Term Investments*,[1] was published. This book "upset more investment ideas, perhaps, than any other book in history."[2] Not everything in Smith's work was new. Many things that he wrote had been asserted or hinted at before. But in his book Smith set forth for the first time the Common Stock Theory, even though he does not appear to have called the theory by that name. It was the statement of this theory by Smith and his re-enforcement of it by many elaborate calculations that ushered in, or at least accelerated, the coming of the so-called "new era" in investment theory.

Although Smith does not use the expression "Common Stock Theory" in his investment study, the theory is expressed more or less informally in several parts of his book. For example, he says:

> A series of studies is here presented, based on a comparison of high grade bonds and of common stocks over different periods extending from the close of the Civil War up to 1922. The cumulative evidence of these studies favors diversified common stocks, even in periods of appreciating currency, such as from 1866 to 1897.[3]

Again in chapter viii Smith says:

> These tests we have made are not in themselves conclusive, but cumulatively they tend to show that well diversified lists of common stocks selected on simple and broad principles of diversification respond to some underlying factor which gives them a margin of advantage over high grade bonds for long term investments.[4]

[1] New York: Macmillan Co.

[2] Editorial, "The Cult of Common Stock—Now," *Commerce and Finance*, February 19, 1930, p. 396.

[3] *Op. cit.*, p. 2.

[4] *Ibid.*, p. 68.

The theory is also found in chapter ix, "Law of Increasing Stock Values and Income Return," where it is stated as follows:

(1) Over a period of years, the principal value of a well diversified holding of common stocks of representative corporations, in essential industries, tends to increase in accordance with the operation of compound interest. (Chart No. 6.)

(2) Such stock holdings may be relied upon over a term of years to pay an average income return on such increasing values of somewhat more than the average current rate on commercial paper. (Chart No. 5.)[5]

Gilbert Harold defines the Common Stock Theory as follows:

The theory as expounded by Smith and Van Strum is that over long periods diversified portfolios of common stocks in leading corporations yield the investor more income, more safety, more market value per portfolio, and also that such common-stock investments, as a group, keep better pace with the cost of living than do bonds as a group.[6]

In connection with this definition it might be well to keep in mind that, according to Smith, the stocks used in the portfolios should be stocks of companies in essential industries and the bonds should be high-grade bonds.

DIFFERENT TYPES OF LONG-TERM SECURITY-VALUE COMPARISONS

Although Smith is the most prominent figure, he is only one of a number of men who have made studies comparing the investment value of different types of securities. Most of the emphasis in these studies has been placed upon the following three types of value comparisons:

1. Comparisons between high-grade stocks and high-grade bonds (from which has developed the Common Stock Theory).
2. Comparisons between different kinds of common stock.
3. Comparisons between common stocks and preferred stocks.

A number of the studies make more than one type of comparison. For example, in Smith's study the major emphasis is placed upon comparing common stocks with bonds, yet some attempt is made to compare different kinds of common stocks. In James Roy Jackson's two investment studies[7] the main purpose is to compare

[5] *Ibid.*, p. 79.

[6] "Reconsideration of the Common Stock Theory," *Journal of Business of the University of Chicago*, VII (January, 1934), 46.

[7] See chap. iii of this study.

common stocks with preferred stocks, yet Jackson devotes some attention to comparing different kinds of common stocks and to comparing different kinds of preferred stocks.

The present study begins with a brief historical review of some of the more important investment studies that have had a bearing upon the development of the Common Stock Theory and other recently created investment theories.

NEW TESTS

The main part of the study is devoted to the making of sixteen new investment tests, the results of which are given following the historical review. The tests are intended primarily to compare stocks with bonds; but since some of them use railroad, some industrial, and some public utility securities, comparisons are also made between different kinds of stocks and between different kinds of bonds. Seven of the tests commence at the beginning of 1913, the remaining nine commence at the beginning of 1923, and all the tests end at the close of 1935. Values in the tests are expressed in actual dollars and in dollars of purchasing power; they are also given in terms of rate of interest or rate of discount on original investment. All the securities used in the tests have been selected from those listed on the New York Stock Exchange. The tests mentioned above differ in one important essential from most investment tests that have compared stocks with bonds, that is, in each of the tests the stocks and bonds compared have been selected from the same companies.

PURPOSE OF THE STUDY

The purpose of the present study is twofold: first, to find out by combining the results secured from the new tests with those attained in previous studies whether or not the Common Stock Theory and certain of the other investment theories still hold true following the recent business depression; and, second, to make a few new suggestions regarding the relative long-term investment value of certain types of securities. The conclusions, drawn from the results of previous works and the present tests, are stated in the final chapter of the study.

CHAPTER II

HISTORICAL REVIEW OF PREVIOUS STUDIES

ACCORDING to Gilbert Harold, the first reference to the desirability of common stocks as long-term investments was made by William Hughes in a statement at a convention of the Institute of Actuaries in London in the year 1902.[1] From the statement made by Hughes, as quoted by Harold, it appears that Hughes did not even so much as suggest the Common Stock Theory. He merely described a study which he thought might be made if anyone possessed the necessary patience. The original investment was to be made "in what might be called speculative securities." Part of the interest realized was to be carried to an insurance or guaranty fund to make good capital losses and deficiencies of revenue.

The first work of importance that helped pave the way for the Common Stock Theory was *How To Invest When Prices Are Rising*, edited by Irving Fisher.[2] The book contained chapters by Irving Fisher, Edwin W. Kemmerer, Harry G. Brown, Walter E. Clark, J. Pease Norton, Montgomery Rollins, and G. Lynn Sumner. It attempted to prove that common stocks are better investments than bonds during periods of rising prices.

In order to help substantiate the contention that during periods of rising commodity prices common stocks are better investments than bonds, J. Pease Norton made two different tests.[3] The first test, which covered the period from January 2, 1901, to January 2, 1910, compared an investment in the common stocks of ten railroads with an investment in the bonds of these same railroads. The second test compared nineteen industrial stocks with railroad bonds. This test covered the period from June, 1900, to June,

[1] "Reconsideration of the Common Stock Theory," *Journal of Business of the University of Chicago*, VII (January, 1934), 42–43.

[2] Scranton, Pa.: G. Lynn Sumner & Co., 1912.

[3] *Ibid.*, pp. 90–96.

1912. Norton estimated that the yield on the stocks in each of the tests was about 11 per cent, while the yield on the bonds was about 2.7 per cent. After adjusting the yields for changes in purchasing power, he reached the conclusion that the actual yield on the stocks was 6 per cent and on the bonds 0 per cent.

The authors of *How To Invest When Prices Are Rising* did not establish the Common Stock Theory. All they attempted to show was that during periods of rising commodity prices common stocks are better investments than bonds. There is nothing in the work to indicate that they believed that over a long period of time—including intervals of both rising and falling commodity prices—an investment in a well-diversified portfolio of high-grade stocks is a better investment than high-grade bonds.

As mentioned before, the Common Stock Theory was first expressed by Smith in his *Common Stocks as Long-Term Investments*. This theory was, however, not what Smith set out to prove when he commenced his study. It had been demonstrated by Fisher and others that during periods of rising commodity prices stocks are better investments than bonds. Smith attempted to show that during periods of falling commodity prices the opposite is true, that is, bonds are better investments than stocks. His findings, however, failed to establish this assumption, and, as a by-product growing out of his "failure," Smith developed the Common Stock Theory.

Smith in *Common Stocks as Long-Term Investments* made twelve different tests. These tests vary in length from seventeen to twenty-two years and extend from the beginning of 1866 to the end of 1922. In each test it was assumed that about $10,000 were invested in approximately equal amounts in each of ten different common stocks. An equal investment was also made in each case in a diversified list of high-grade railroad bonds. Most of the securities used by Smith were selected from those listed on the New York Stock Exchange, but a few were selected from the Boston Stock Exchange.

Tests No. 1, 2, 3, 9, 10, and 11 cover a period of time during which the general trend of commodity prices was upward. These tests all covered the period from the beginning of 1901 to the end

of 1922. The stocks used in Tests No. 1, 2, and 3 were industrial and public utility stocks. All these tests showed a decided advantage in favor of common stocks. The stocks used in Tests No. 9, 10, and 11 were all stocks of large railroad companies. In Test No. 9 the basis of selection was the ten railroads with the largest stock issues; in Test No. 10, the ten railroads with the largest stock issues which paid dividends on the common stock in 1900; and in Test No. 11, the ten railroads with the largest stock issues which paid no dividends in 1900. All three of these tests showed an advantage to stocks over bonds, but not as much advantage as was shown in Tests No. 1, 2, and 3, where the securities used were a combination of industrial and public utility stocks. In connection with the railroad-stock tests it is noteworthy that the non–dividend-paying stocks proved to be a better investment than the dividend-paying stocks.

There is so much evidence at hand in the form of investment tests and otherwise to the effect that during periods of rising commodity prices high-grade common stocks in the aggregate are a better investment than high-grade bonds in the aggregate, that this part of the proof of the Common Stock Theory can almost be assumed as self-evident. But that portion of the proof which has to do with intervals of time in which the general trend of commodity prices is downward, or in which it is neither upward nor downward, is still inadequate. This portion of Smith's study is covered by only four tests, namely, Tests No. 4, 5, and 6, which cover a period of falling commodity prices, and Test No. 7, which covers a period of falling prices followed by a period of rising prices.

Tests No. 4, 5, and 6 all cover periods in which the general trend of commodity prices was downward. The stocks used in these tests were miscellaneous stocks consisting of railroad, industrial, and public utility stocks. Test No. 4 extends from 1880 to 1899. The stocks proved to be a considerably better investment than bonds. Tests No. 5 and 6 extend from 1866 to 1885, a period of pronouncedly falling commodity prices. Test No. 5 showed a slight advantage in favor of common stocks, while Test No. 6 showed a slight advantage in favor of bonds. But if Smith had

not favored bonds in his calculations, even the apparent advantage to bonds would have disappeared.[4]

Test No. 7 extends from 1892 to 1911 and covers a period of falling commodity prices followed by a period of rising commodity prices. The ten stocks used in this test were a mixture of railroad, industrial, and public utility stocks. The basis for stock selection was largest capitalization and regularity of dividend payment. This test showed results decidedly in favor of common stocks.

Smith, therefore, attempts to show by means of only three tests of ten stocks each that high-grade bonds are not superior to high-grade stocks during a period of falling commodity prices, and he attempts to show by means of a single test of ten stocks that high-grade stocks are a better investment than high-grade bonds during a period in which prices first fall and then rise to about previous levels. Because of a number of duplications the actual number of different stocks used in these four tests is only thirty-two, eight of which are railroad stocks, fourteen, industrial stocks, and ten, public utility stocks. When one considers the small number of stocks used in these averages, it can readily be seen that Smith's results might or might not in any way represent the true value of common stocks in the aggregate over the periods covered by these four tests. Another criticism which might be brought against this part of Smith's study is that because of the method which he used in selecting his stocks it is probable that at least a part of these securities were more or less speculative and, therefore, not suitable to test the validity of the Common Stock Theory.

Tests No. 8 and 8(*a*) both cover a period of rising commodity prices and extend from 1906 to 1922. The basis of stock selection in each of these tests was large industrial companies. In both cases common stocks proved to be the better investment.

Kenneth S. Van Strum's study[5] resembles very closely that made by Smith, although it does differ in certain respects. Van Strum made, in all, eighteen different tests. Tests No. 1–4 covered a period of time in which the general trend of commodity

[4] Irving Fisher, "When Are Gilt Edge Bonds Safe?" *Magazine of Wall Street*, April 25, 1925, pp. 1160–61.

[5] *Investing in Purchasing Power* (New York: Barron's, 1925).

prices was downward. All these tests except Test No. 2 covered the period from 1873 to 1897. Test No. 2 covered the period from 1878 to 1897. Tests No. 5–8, with the exception of Test No. 6, extended from 1883 to 1906. Test No. 6 extended from 1884 to 1906. During the first part of the period covered by these tests the general trend of commodity prices was downward and during the latter part it was upward. Tests No. 9–18 covered a period in which the general trend of commodity prices was upward. All these tests except Test No. 10 covered the period from 1897 to 1924. Test No. 10 covered the period from 1899 to 1924.

The basis used in selecting common stocks in Van Strum's first thirteen tests is the five largest railroads and the five largest industrials,[6] size being determined by the amount of common stock outstanding. In all these thirteen tests except Tests No. 4, 8, and 13 it was assumed that the total investment was made at the beginning of the test, but in Tests No. 4, 8, and 13 the assumption was made that one stock was purchased each year of the test in each of the five largest railroads and five largest industrial companies. The actual number of different companies in Van Strum's tests is much less than one might anticipate, considering the number of tests he made. Because of the method of selecting securities, there is much duplication of stocks in the different tests.

The stocks used in Test No. 14 were the stocks of the ten largest industrial companies which paid dividends from 1893 to 1897. The stocks used in Test No. 15 were ten industrials which had no regular dividend record from 1890 to 1897 and which sold below $50 per share. In Test No. 16 the fund was always invested in the common stocks included in the Dow-Jones railroad averages. In Test No. 17 the fund was always invested in the common stocks included in the Dow-Jones industrial averages. In Test No. 18 the fund was always invested in the common stocks included in the Dow-Jones industrial averages, but in this case General Motors was not included because it had a substantial rise in price.

Van Strum's tests, made during periods of falling commodity prices, show stocks and bonds to be about equal as investments, in spite of the fact that bonds were favored in the calculations.

[6] Van Strum includes both industrials and public utilities under industrials.

Tests made during periods in which commodity prices first fell and then rose to about previous levels or during periods of rising commodity prices showed stocks to be much better investments than bonds. Industrial stocks were better investments than railroad stocks during a period of rising commodity prices, and low-priced industrial stocks with poor dividend records proved to be better investments than high-priced industrial stocks with good dividend records. An interesting feature found in Van Strum's study but not in Smith's is that values are expressed not only in terms of actual dollars but also in terms of dollars of purchasing power.

Van Strum's tests that covered periods of falling commodity prices, that is, Tests No. 1, 2, 3, and 4, are no more convincing than those made by Smith. Because of many duplications the total number of stocks used in these four tests to prove that high-grade bonds are not better investments than high-grade stocks during periods of falling commodity prices was only twenty-two.

Van Strum's four tests, Nos. 5, 6, 7, and 8, which attempt to show that stocks are better investments than bonds during periods in which prices first fall and then rise to about previous levels are also handicapped by the use of an inadequate number of stocks in the averages. These four tests make use of only twenty-seven stocks, including two preferred stocks.

Another study similar to the one made by Smith but covering a period of rising prices only was made by H. S. Pearson.[7] Pearson made seven different tests, each covering the period from January, 1901, to January, 1923. In each test an investment of $10,000 was divided equally among ten different stocks. The income received each year from the stocks was invested the following January, "in rough rotation," in the list of stocks already held. It was assumed that the bonds with which the stocks were compared earned interest at the rate of 4 per cent per annum.

All Pearson's tests except one using "low, non-dividend railroads" showed stocks to be better investments than bonds. Of the different types of stocks used in the tests "insurance stocks" proved to be the best investment. "Highest market value rail-

[7] In Arthur Stone Dewing, *The Financial Policy of Corporations* (New York: Ronald Press Co., 1926), p. 1239.

roads" were better than "low, non-dividend railroads," and "highest market value industrials" better than "lowest market value industrials." The tests showed industrial stocks to be superior to railroad stocks. Pearson's study, like the studies made by Smith and Van Strum, might be criticized because of the arbitrary method used in valuing bond investments. Moreover, since all the seven tests were made during a period of rising commodity prices, the study is of limited importance in helping substantiate the Common Stock Theory.

Another study designed to test the merits of common stocks during a period of rising commodity prices was made by T. S. Shore.[8] Shore attempted not only to test the relative merits of industrial, public utility, railroad, and banking stocks, but he also attempted to find out the relative merits of different types of industrial, public utility, and railroad stocks. He made, in all, nine different tests: three involved industrial stocks; three, public utility stocks; two, railroad stocks; and one, bank stocks. The period of time covered by the tests was 1910–25. In each test Shore assumed that $1,000 was invested in securities at the beginning of each year for ten years. All earnings on securities held were reinvested annually by the purchase of additional securities. Of the different kinds of stocks studied, industrials as a class proved to be the best investment. Then, in order, came banking stocks, public utility stocks, and railroad stocks. Although industrials as a class were better than public utilities as a class, the best public utility test showed a higher yield than the poorest industrial test.

In 1926 Edwin Stugard made an investment study,[9] consisting of three tests, in which he attempted to find out which are better investments—high-grade, second-grade, or speculative stocks. The study covered the period 1918–25. In each of the three tests he used ten industrial stocks selected according to popular investment ratings. Results of the tests show that the high-grade stocks were the best investment, that the second-grade were the next best, and that the speculative stocks were the poorest. The study was later extended by the author to September, 1932. At that

[8] *Ibid.*, pp. 1240–41.

[9] "Have 'Blue Chip' Stocks Stood the Test?" *Barron's*, September 12, 1932, p. 8.

time, as to investment value, the three types of industrials were ranked in the same order as in 1925.

One of the more recent investment studies is that made by Gilbert Harold.[10] In this study Harold gives a history of the origin of the Common Stock Theory and outlines the more important studies that have had a bearing upon this theory. Finally he takes three of Smith's tests, Tests No. 2, 3, and 11, from among six tests which cover the period from 1901 to 1922 and extends them to the end of 1932. At the end of 1932 each of the three tests showed that the stocks had been better investments than Smith's assumed 4 per cent bond yield. Harold concludes: "It is the opinion of the present writer that if one accepts the Smith tests, the Van Strum experiments, and the above described abridged extension of the Smith tests, the common-stock theory stands upon a firm base shaken by the developments of 1932, but not destroyed."[11]

It might, however, be pointed out that because of the great variation in profitableness of different stocks, thirty stocks are not a great many upon which to base a conclusion. It might be further contended that the particular thirty stocks under consideration are not, or at least were not at the time of their original selection, ideal stocks for testing the validity of the Common Stock Theory. The theory calls for high-grade stocks. The basis for selecting stocks in Test No. 2 was a combination of consistent dividend record and highest yield on purchase price. In Test No. 3 the basis of selection was a combination of consistent quotation and largest number of transactions. And in Test No. 11 the basis of selection was largest non–dividend-paying companies.

One of the most elaborate of the investment studies was made by Dwight C. Rose and published in two volumes. In Volume I, *A Scientific Approach to Investment Management*,[12] Rose studied the investment experience of twenty-five large fire insurance companies in the United States from 1908 to 1927. He found that the average annual return from the bonds owned by these twenty-five companies over the nineteen-year period was 4.73 per cent, while the average annual return on the stocks was 7.24 per cent. Rose

[10] *Op. cit.*, pp. 42–59.

[11] *Ibid.*, p. 59.

[12] New York: Harper & Bros., 1928.

says that the yield on the stocks was lowered because of the fact that somewhat more than one-fourth of them were preferred issues.

In Volume I Rose made a further analysis of investment experience. In this test he compared the investment values of the stocks and bonds used in the Dow-Jones averages. The period covered was 1901–28. Because of the fact that the Dow-Jones bond averages were not started until 1915, it was necessary for Rose to extend these averages back to 1901. The test showed that the stocks were a better investment than the bonds and that the industrial stocks were a better investment than the railroad stocks. Of the bonds, public utilities were best. Next in order came industrials, second-grade rails, and high-grade rails.

In Volume II, *The Practical Application of Investment Management*,[13] Rose extended his study five years further, from the beginning of 1928 to the beginning of 1933. In spite of the fact that railroad stocks made a very poor showing during this period, his study shows stocks in the aggregate to be a better long-term investment than bonds.

J. L. Amberg, in order to test the validity of the Common Stock Theory under conditions of business depression, made three investment tests that covered the period from 1913 to 1931.[14] The stock investment in each of the tests was made in ten different stocks. In Test No. 1 the basis of stock selection was largest volume of transactions in the year 1913. In Test No. 2 the basis of stock selection was five largest rails and five largest industrials. In Test No. 3 the stock investment was made in ten high-grade industrials. It was assumed in all cases that the yield on the bonds was $4\frac{1}{2}$ per cent. In each of the three tests the stocks proved to be a better investment than the assumed $4\frac{1}{2}$ per cent bond yield.

Another study designed to test the validity of the Common Stock Theory during a period of business depression was made by D. M. Clayton.[15] The first of Clayton's tests extended Smith's first test to December 31, 1931. In his second test Clayton ex-

[13] New York: Harper & Bros., 1933.

[14] "Testing the Theory of Stocks for Long-Term Investment in a Bear Market," *Magazine of Wall Street*, February 7, 1931, pp. 503–5.

[15] In Chelcie C. Bosland, *The Common Stock Theory of Investment* (New York: Ronald Press, 1937), pp. 27–32.

tended one of Van Strum's tests to June 30, 1931. Clayton's third test covered the period from 1920 to 1931. The basis of selection for the ten stocks used in this test was volume of stock transactions. All three of Clayton's tests showed stocks to be better investments than bonds.

Perhaps the most inclusive of all investment studies is the recent study made by the Cowles Commission.[16] This study covers the period from 1871 to 1937. The stocks used in the stock averages include most of the common stocks listed on the New York Stock Exchange during this period of time and, subsequent to 1925, important common stocks listed on the New York Curb and a few other exchanges. The study shows a return of 4.8 per cent for the railroad stocks, 6.1 per cent for the utility stocks, and 8.3 per cent for the industrial stocks. The combined return for the railroad, utility, and industrial stocks is 6.8 per cent. During the same period of time the average yield on high-grade bonds was about 4.2 per cent. But even though this study shows common stocks to be superior to high-grade bonds, it does not prove the Common Stock Theory. This theory as stated by Smith, Van Strum, Harold, and others calls for high-grade stocks in essential industries, but evidently many of the stocks used by the Cowles Commission do not meet these requirements.

Although the Common Stock Theory at the present time is very generally accepted as true, this theory has its critics. Among those who have criticized it is Arthur H. Herschel.[17] Herschel's criticism seems to show that he did not have a very clear idea as to just what the Common Stock Theory is. He admits that stockholders might at times fare well during periods of rising prices but seems to have the idea that during periods of falling prices bond investments are better than stock investments, a proposition which, of course, the advocates of the Common Stock Theory do not admit. He says that no one knows when an investment is going to end, intimating that if it ends during a period of falling prices bondholders will fare better than stockholders. Common-

[16] Alfred Cowles III and Associates, *Common Stock Indexes, 1871–1937* (Bloomington, Ind.: Principia Press, 1938).

[17] "The Investment Risk of Common Stocks," *Commercial and Financial Chronicle*, November 14, 1925, pp. 2337–38.

stock advocates admit that this might be true for a number of years after the stock investment but maintain that if the investment is held for a sufficiently long time it will in all cases be a better investment than bonds, whether the investment ends during a period of rising or of falling prices. In one place Herschel tries to prove his contention by telling what might happen to a single stock. He does, however, make one comment which is worthy of consideration when he says: "Out of ten carefully selected companies how many may be obliged to reduce their dividends?" If because of the fact that so many investment tests employ only ten stocks in comparing stocks with bonds people have been led to believe that any ten high-grade stocks will make a better long-term investment than high-grade bonds, then Herschel's point is well made.

Other critics of the Common Stock Theory are Lawrence Chamberlain and William Wren Hay.[18] Their criticism is largely directed toward Smith but to some extent toward Van Strum. They find fault with the title of Smith's work, *Common Stocks as Long Term Investments*, because it suggests that average or typical stocks are used in the study. The securities used, however, are not average or typical, as they are picked for the most part from among those listed on the New York and Boston stock exchanges. Moreover there is nothing in the title to indicate that the stocks are to be compared with bonds. Chamberlain and Hay point out that there exist in the United States common stocks of four or five hundred thousand American corporations engaged in business and the stocks of two hundred thousand of these corporations are to all intents and purposes worthless. If information were available to make a study that truly represented the investment value of these securities, the results might be considerably different from those secured by Smith. They contend further that if data were not available to make a study comparing average stocks with average bonds, Smith should have compared high-grade stocks with high-grade bonds. The bonds used by Smith were high-grade bonds, but some of the stocks used were not high grade. If the bonds used in the comparison had been more speculative, with an

[18] *Investment and Speculation* (New York: Henry Holt & Co., 1931), pp. 34–56.

element of risk comparable to that of the stocks, the results obtained by Smith might not have been so favorable to stocks.

Chamberlain and Hay criticize Van Strum's conclusion that non-dividend stocks are better investments than dividend-paying stocks. They point out that low-priced stocks appreciate in value more than any other kind of stocks during periods of rising prices but say that such securities are not to be classified as long-term investments.

H. D. Kellogg and R. E. Kilbourne claim to have disproved the Common Stock Theory.[19] Their study covers the period from 1922 to 1933 and includes all the common stocks, preferred stocks, and bonds listed on the New York Stock Exchange during these years. Their tests showed bonds to be a better investment than either common or preferred stocks. It is difficult, however, to see how these findings disprove the Common Stock Theory. In the first place, the Common Stock Theory is a long-term theory, and, in the second place, it includes only high-grade stocks and bonds. Still further the period under consideration is unfair to common stocks, since business was better in 1922 than in 1933 and wholesale commodity prices were higher in 1922 than in 1933.

James Roy Jackson made two separate studies which compare the relative investment values of common and preferred stocks. The first study[20] covers the period from 1904 to 1924. In this study Jackson used the stocks of thirty-one railroad, forty-eight industrial, and eleven public utility companies. The preferred stocks were from the same companies as the common stocks. From his first study Jackson concludes that common stocks appear in all cases to be better investments than preferred stocks, and of the stocks, industrials appear to be best, then public utilities, with rails the poorest of the three.

Jackson's second study[21] covers a longer period of time than the

[19] "Bonds Generally More Satisfactory than Stocks as Long-Term Investments," *Annalist*, February 9, 1924, pp. 259–60.

[20] "Statistical Comparison of Common and Preferred Stocks as to Investment Value" (unpublished A.M. diss., department of commerce and administration, University of Chicago, 1924).

[21] "A Statistical Comparison of Common with Preferred Stocks" (unpublished Ph.D. diss., department of economics, University of Chicago, 1927).

first, and the tests include a greater number of stocks. These tests cover the period from 1886 to 1925. The stocks used include all the railroad, industrial, and public utility stocks listed on the New York, Boston, Philadelphia, Chicago, Pittsburgh, and St. Louis stock exchanges for which quotations could be found in the *Commercial and Financial Chronicle* for both common and preferred stocks. Since the number of eligible stocks varied from year to year, the number included in the tests varied accordingly. No public utility stocks were included until 1891. The minimum number of railroads used in any one year was twenty-three, the maximum number in any one year fifty-one. Industrials varied in numbers in the different years from one to one hundred and two and public utilities from one to twenty-six.

Jackson's second study is designed primarily to find out two things: First, during what percentage of the years covered by a test are common stocks in the aggregate better investments than the preferred stocks of the same companies in the aggregate? Second, assuming that the stock investments run for periods of time of two years or longer, which are better investments in the aggregate, common stocks or the preferred stocks of the same companies? In answer to the first of these questions Jackson reached the conclusion that over a series of years—assuming investments to be made for a period of one year only—common stocks are better investments than preferred stocks about as often as preferred stocks are better investments than common stocks. In answer to the second question Jackson decided that, in the main, over a period of years common stocks are better investments as a class than preferred stocks, but the difference was not marked, and there were periods of time during which preferred stocks were better investments than common stocks.

Some other conclusions which Jackson drew from his second study are: First, different classes of securities, namely, rails, industrials, and public utilities tend to move together, but there are a few exceptions to this rule. Second, the holder of more speculative securities receives a greater return than the holder of less speculative securities, but only a little more. Third, common stocks fluctuate more widely in value than do preferred stocks,

and non-dividend stocks fluctuate in value more than dividend-paying stocks. Jackson cautions the reader, however, that in interpreting the results of his study he should keep in mind that those results are drawn in large measure from a period of rising prices.

Another study designed to test the merits of preferred stocks as long-term investments was made by Robert G. Rodkey.[22] This study covers the period from 1908 to 1932. Rodkey made six tests: four of these compare common stocks with preferred stocks, and two compare common stocks, preferred stocks, and bonds. Each test includes the securities of only ten companies. Rodkey's tests show: first, a higher return on common stocks than on preferred stocks; second, a higher return on industrial stocks than on railroad stocks; and third, a higher return on industrial preferred stocks not preceded by bonds than on industrial preferred stocks preceded by bonds.

A. V. Woodworth's study,[23] which compares common stocks and preferred stocks of industrial companies, confirms the findings of Jackson and Rodkey that common stocks have been better long-term investments than preferred stocks. Woodworth made two tests, the first ending in 1923 and the second in 1926. In these tests the common stocks and preferred stocks of only industrial companies were compared. The common stocks and preferred stocks were from the same companies. An investment was made in the common stock and preferred stock of each company at the earliest date on which quotations could be found for both common and preferred stock. Six hundred and eighty-one companies were represented in the first test and 653 in the second test. In each test the companies were divided into 34 industries. And in each test the common stock was a better investment than the preferred stock in 31 of the 34 industries.

[22] *Preferred Stocks as Long-Term Investments* ("Michigan Business Studies") (Ann Arbor: University of Michigan, School of Business Administration Bureau of Economic Research, 1932).

[23] "Common vs. Preferred Stock as an Investment over a Long Period of Years," *Annalist*, May 23, 1930, pp. 1107–9.

CHAPTER III

METHOD OF MAKING TESTS

GENERAL NATURE OF THE TESTS

THE present study makes sixteen new tests. In each of these tests common stocks are compared with bonds. The securities are chosen in pairs, that is, for each stock selected a corresponding bond is selected from the same company. All securities used are selected from the common stocks and bonds listed on the New York Stock Exchange and quoted in the *Commercial and Financial Chronicle*. Guaranteed stocks are not included in the tests, as they do not appear to be true stocks but seem to have some of the characteristics of bonds. Convertible bonds have also been excluded, for under certain conditions they behave more like stocks than bonds. An outline showing the period of time covered and the nature of comparison made in each of the sixteen tests is given here:

No. of Test	Period Covered	Nature of Comparison
1	1913–35	Railroad stocks with railroad bonds
2	1913–35	Industrial stocks with industrial bonds
3	1913–35	Public utility stocks with public utility bonds
4	1913–35	Dividend-paying railroad stocks with railroad bonds
5	1913–35	High-priced railroad stocks with railroad bonds
6	1913–35	Non–dividend-paying railroad stocks with railroad bonds
7	1913–35	Low-priced railroad stocks with railroad bonds
8	1923–35	Railroad stocks with railroad bonds
9	1923–35	Industrial stocks with industrial bonds
10	1923–35	Public utility stocks with public utility bonds
11	1923–35	Test No. 1 with base changed to the beginning of 1923
12	1923–35	Test No. 2 with base changed to the beginning of 1923
13	1923–35	Test No. 3 with the base changed to the beginning of 1923
14	1923–35	Tests No. 8 and 11 combined
15	1923–35	Tests No. 9 and 12 combined
16	1923–35	Tests No. 10 and 13 combined

METHOD OF SELECTING FIRST SECURITIES USED AND OF MAKING SECURITY SUBSTITUTIONS

METHOD OF SELECTING STOCKS FIRST USED IN TESTS NO. 1, 2, AND 3

The stocks first used in Tests No. 1, 2, and 3 were selected in the following manner. Three separate lists were made. One of these lists contained all the railroad companies, one all the industrial companies, and one all the public utility companies that had both common stocks and bonds listed on the New York Stock Exchange and quoted in the *Commercial and Financial Chronicle* for both the beginning and the end of the year 1913. From the lists were removed all companies which had only guaranteed common stock or convertible bonds listed on the Exchange. There now remained on the three lists fifty-two railroad, twenty-four industrial, and sixteen public utility companies, and the common stocks of these companies supplied the stocks first used in Tests No. 1, 2, and 3, respectively.

METHOD OF SELECTING BONDS FIRST USED IN TESTS NO. 1, 2, AND 3

The bonds used in each of the tests were, as has been said, from the same companies as the stocks. Therefore, in selecting the first bonds used in Tests No. 1, 2, and 3, it was necessary to choose a bond from each of the companies represented in the tests. If a company had more than one bond listed on the Exchange an attempt was made to select the most conservative of these bonds. In many cases, especially with the railroads, it was difficult to tell just which of the available bonds was of the highest grade, since a single company often had a number of different bonds listed and at the same time had a very complicated bond structure. No doubt in a number of cases, had time permitted a more careful analysis, a more conservative bond might have been found than the one selected. But in spite of this fact it is believed that, as a general rule, from the bonds available the more conservative ones were chosen.

METHOD OF MAKING SECURITY SUBSTITUTIONS IN TESTS NO. 1, 2, AND 3

Whenever a security that was included in the portfolio of Tests No. 1, 2, and 3 ceased to be quoted in the *Commercial and*

Financial Chronicle, this security was dropped from the test and another security substituted in its place. If the security dropped from the portfolio was a stock, it was sometimes also necessary to drop from the portfolio the corresponding bond, that is, the bond issued by the same company. If the security dropped was a bond, it was sometimes necessary to drop the corresponding stock.

When it was necessary to drop a stock from a test because it was no longer quoted, the following procedure was followed in making the necessary substitution or substitutions: If the stock was taken off the Exchange because the company that issued it ceased to exist through a reorganization, consolidation, or merger, and if the company that took over the assets and liabilities of the dissolved company had a qualifying stock and bond listed on the Exchange, then the stock of the new company was substituted for the stock of the old company. It was not necessary to substitute a new bond when the bonds of the dissolved company were assumed by the reorganized or consolidated company. When a stock ceased to be quoted and it was discovered that a large percentage of the stock of this company had been purchased by some other company, then the stock and a bond of this holding company were substituted for the securities of the company whose stock had been taken off the Exchange.

If a stock ceased to be quoted for any reason other than those mentioned, this stock and its corresponding bond were dropped from the list and two new securities substituted in their places. The method of making the substitution was as follows: First an attempt was made to find in the *Commercial and Financial Chronicle* a company of the same general type that had a qualifying stock and bond which had not already been used in one of the tests. If such a company were found, its securities were substituted for those of the company whose stock had been removed from the Exchange. If such a company could not be found, there was chosen from the list of railroad, industrial, or public utility stocks quoted in the *Commercial and Financial Chronicle*, according to the nature of the test, the first available pair of qualifying securities which had not been previously used, and these were substituted for the securities dropped from the test.

When it was necessary to make a substitution, or substitutions, because one of the bonds in a test was taken off the Exchange, another bond of the same company was substituted for it, provided such a bond was available. If such a bond were not available, it was not only necessary to drop the old bond from the test but also its corresponding stock and to substitute two new securities in their places. The securities substituted for the ones dropped were selected from among those quoted in the *Commercial and Financial Chronicle*, and the method of selection was the same as that used in making stock substitutions, described above.

METHOD OF SELECTING SECURITIES USED IN TESTS NO. 4, 5, 6, AND 7

The stocks and bonds used in Tests No. 4, 5, 6, and 7 were all selected from the securities employed in Test No. 1. The bases of selection for the stocks first used in these four tests were as follows: For Test No. 4, all the stocks used in Test No. 1 which paid cash dividends during 1912 and for each of the four preceding years; for Test No. 5, all the stocks used in Test No. 1 that sold at the beginning of 1913 for $50 a share or more; for Test No. 6, all the stocks used in Test No. 1 which paid no dividends in 1912 or during any of the four preceding years; and for Test No. 7, all the stocks used in Test No. 1 which at the beginning of 1913 sold for less than $50 a share. The bonds used in conjunction with the stocks in each of these four tests were the same bonds that were used with these stocks in Test No. 1. Substitutions were the same as in Test No. 1.

METHOD OF SELECTING SECURITIES USED IN TESTS NO. 8, 9, AND 10

Tests No. 8, 9, and 10, like Tests No. 1, 2, and 3, compare railroad, industrial, and public utility stocks with railroad, industrial, and public utility bonds, respectively. These tests, however, commence at the beginning of 1923 instead of at the beginning of 1913. The method of selecting securities for Tests No. 8, 9, and 10 was practically the same as that employed in selecting securities for Tests No. 1, 2, and 3. In selecting the stocks and bonds to be used first in these tests, however, all the stocks and bonds which had

already been used in Tests No. 1, 2, and 3 were excluded, and the selection was made from the remaining listed and quoted securities. The method of substituting new securities for old was the same as that used in Tests No. 1, 2, and 3.

METHOD OF SELECTING SECURITIES USED IN TESTS NO. 11, 12, AND 13

In a way, Tests No. 11, 12, and 13 are not new tests. They are simply Tests No. 1, 2, and 3, whose base is the beginning of the year 1913, adjusted to a base beginning the year 1923. At the beginning of the first year of each test it was assumed that the investment relative of each of the securities was equal to 1. In later years this equality was disturbed by the varying success of the different investments. By the beginning of 1923 the investment relatives of the securities used in Tests No. 1, 2, and 3 had become very unequal. Tests No. 11, 12, and 13 correct these inequalities and show what the results would have been from the beginning of 1923 to the end of 1935 if the investment relative of each of the securities used in Tests No. 1, 2, and 3 had been equal to 1 at the beginning of 1923.

METHOD OF SELECTING SECURITIES USED IN TESTS NO. 14, 15, AND 16

Tests No. 14, 15, and 16 all extend from the beginning of 1923 to the end of 1935. Test No. 14 combines all the securities used in Tests No. 8 and 11; Test No. 15 combines all the securities used in Tests No. 9 and 12; and Test No. 16 combines all the securities used in Tests No. 10 and 13. These tests were made in the hope that by increasing the number of securities used in the averages a more accurate picture of the aggregate value of the different types of securities might be obtained.

METHOD OF COMPUTING THE INVESTMENT VALUE OF STOCKS

The total original stock investment in each of the sixteen tests was so prorated among the individual stock investments as to purchase one share of stock in each of the companies represented. The investment first made in each test was made at the beginning of a year (either 1913 or 1923), and the stocks were valued at that

time and at the beginning of each succeeding year of the test, including the beginning of 1936. The method used for valuing a share of stock at the beginning of any year of a test was as follows: The average of the high and low quotations of the stock for the preceding December was averaged with the average of the high and low quotations for January of the year in question, and the resulting average was the value assigned to the stock for the beginning of the year. If quotations could not be found for December or for January, then the average of the high and low quotations for the first month preceding December or the first month following January for which quotations could be found was used in the average. It might have been more logical to use the average of the high and low quotations for January 1 to represent the value of a share of stock at the beginning of a year, but because of the fact that many securities were not quoted regularly, it did not seem practical to use this method of valuation.

The beginning value of each individual stock investment was, as explained before, the value of one share of stock. At the end of the first and each succeeding year of an individual stock investment the money value of any income received on the investment during the year in the form of cash dividends, stock rights, and miscellaneous dividends (except the companies' own stock dividends and stock splits) was determined. It was assumed that the sources of income above mentioned, if any, were all converted into cash and used to purchase more stock of the same kind as that already held. In valuing stock rights the assumption was made that they were sold during the first month in which they were quoted, at the average of the high and low quotations for the month. Miscellaneous dividends were valued and sold at the end of the year.

The number of shares of stock owned in an individual stock investment at the end of the first and each succeeding year of the investment was determined as follows: The income received during the year on the individual stock investment was divided by the value of one share of stock at the end of the year; 1 was added to the quotient, and the sum was multiplied by the number of shares owned at the beginning of the year. If stock dividends had

been received or stock splits had been made during the year, the number of shares owned was increased proportionately. The value of an individual stock investment at the end of the first and each succeeding year of the investment was obtained by multiplying the number of shares owned at the end of the year by the value of one share of stock. If it was necessary at the end of the year to drop the old stock and substitute in its place the stock of another company, the number of shares obtained in the new company was determined simply by seeing how many shares of the new stock could be purchased by the proceeds from the sale of the stock that was dropped.

After the annual values of an individual stock investment had been determined, a series of annual relatives was constructed from these values. In constructing the relatives the cost of the share of stock first used in the individual stock investment was given a value of 1, and the relatives for the following years were determined by dividing the investment values of those years by the cost of this first share of stock. The result shows, in effect, what one dollar invested in this particular stock investment would have amounted to at the end of each year of the investment.

After investment relatives had been constructed for each of the individual stock investments used in the sixteen tests, these relatives were grouped according to tests and averaged arithmetically. The resulting indexes show by years for each test the investment value of an investment of one dollar made at the beginning of the test and divided equally among all the individual stock investments used in the test.

METHOD OF COMPUTING THE INVESTMENT VALUE OF BONDS

The method used in computing the investment value of bonds was almost identical with that used in computing the investment value of stocks. The calculations were, however, somewhat simplified, as there were no items to be considered that corresponded to stock rights, miscellaneous dividends, stock dividends, and stock splits.

CHAPTER IV

THE TESTS MADE IN THE PRESENT STUDY

AN INVESTMENT TEST SHOULD FAVOR NEITHER STOCKS NOR BONDS

IF AN investment test is to make a fair comparison between stocks and bonds as long-term investments, the period covered by the test should favor neither stocks nor bonds. Because of the fact that stocks tend to fluctuate more widely in value than bonds, it would not be difficult for a person to demonstrate almost anything that he wished to prove in regard to the relative investment value of stocks or bonds, provided that he selected appropriate beginning and ending dates for his tests. Of course, if the tests were to extend over a sufficiently long period of time, this might be more difficult to do, as any inherent superiority of one type of security over another would in time begin to assert itself. At any rate, the beginning and ending dates of all investment tests that cover relatively short periods of time are of vital importance to the results attained, and unless one uses extreme care in selecting these dates the tests may not show the true relative long-term investment values of the different types of securities compared.

WHEN DOES A PERIOD OF TIME FAVOR STOCKS OR BONDS?

Roughly speaking, a period of time favors stocks when during that period stocks have a temporary advantage over bonds which will be offset in a subsequent period by a counterbalancing advantage to bonds; and, roughly speaking, a period of time favors bonds when during that period bonds have a temporary advantage over stocks which will be offset during a subsequent period by a counterbalancing advantage to stocks. Actually, however, the explanation is not quite this simple, since during a given period of time stocks may have a number of temporary advantages over bonds while at the same time bonds may have a number of tem-

porary advantages over stocks. Under these conditions, if the stocks have a net advantage, the period favors stocks; or, if the bonds have a net advantage, the period favors bonds. Some of the factors which may give one type of security a temporary advantage over another are changes in commodity prices, changes in the volume of business activity, lagging railroad and public utility rates, and speculative forces.

Changes in commodity prices may give stocks a temporary advantage over bonds, or bonds a temporary advantage over stocks. These advantages may be either direct or indirect. An increase in commodity prices tends directly to bring about an increase in stock prices, and a decrease in commodity prices tends directly to bring about a decrease in stock prices; on the other hand, changes in commodity prices, or, in other words, changes in the value of money, have no direct effect upon bond prices. The reason for this is that the bondholders' equity is a money equity, while the stockholders' equity is, as a rule, an equity in assets, of which money makes up only a small part. It naturally follows that an increase in commodity prices will give stocks a temporary advantage over bonds if the secular trend of commodity prices is downward or if it is neither upward nor downward. If the secular trend of commodity prices is upward, however, an increase in commodity prices will give stocks a temporary advantage over bonds only when commodity prices rise at a more rapid rate than the secular trend. It also follows that a decrease in commodity prices will give bonds a temporary advantage over stocks if the secular trend of commodity prices is upward or if it is neither upward nor downward. If the secular trend of commodity prices is downward, however, a decrease in commodity prices will give bonds a temporary advantage over stocks only when commodity prices fall at a more rapid rate than the secular trend.

In addition to the direct advantage that changes in commodity prices may give stocks over bonds or bonds over stocks, they may aid indirectly in giving one type of security an advantage over another. The reason for this is that changes in commodity prices are a factor in determining the profits of business corporations, and profits are a factor in determining security prices. To the ex-

tent that changes in commodity prices aid in increasing profits, they aid in giving stocks a temporary advantage over bonds; and to the extent that changes in commodity prices aid in decreasing profits, they aid in giving bonds a temporary advantage over stocks. This results from the fact that an increase in profits tends to cause a greater increase in stock prices than in bond prices, while a decrease in profits tends to cause a greater decrease in stock prices than in bond prices.

Another factor which may give stocks a temporary advantage over bonds, or bonds a temporary advantage over stocks, is changes in the volume of business activity. Increases in business activity tend to increase profits, and decreases in business activity tend to decrease profits. Consequently, increases in business activity give stocks a temporary advantage over bonds when business activity increases at a more rapid rate than the secular trend of business activity; but when business activity increases at a less rapid rate than the secular trend, or when business activity decreases, bonds enjoy a temporary advantage over stocks.

Lagging railroad and public utility rates give railroad and public utility bonds a temporary advantage over railroad and public utility stocks during periods of rising commodity prices and give railroad and public utility stocks a temporary advantage over railroad and public utility bonds during periods of falling commodity prices. The reason for this is that lagging rates tend to decrease profits during periods of rising commodity prices and increase profits during periods of falling commodity prices. Lagging railroad and public utility rates may even cause a period that favors industrial stocks over industrial bonds to favor railroad and public utility bonds over railroad and public utility stocks. For example, the present study shows that between 1915 and 1919 industrial stocks were a much better investment than industrial bonds, while during the same period railroad and public utility bonds were better investments than railroad and public utility stocks.

A fourth factor which may temporarily give one type of security an advantage over another is speculative forces. By speculative forces is meant that group of forces which during a stock-

market boom bids up stock prices to unreasonable heights, and that group of forces which during a business depression depresses stock prices to far below their true investment value. Of course, those forces which bid up stock prices to unreasonable heights favor stocks, and those forces which depress stock prices to far below their true investment value favor bonds.

DO THE TESTS OF THE PRESENT STUDY FAVOR STOCKS OR BONDS?

The first seven tests, as stated before, cover the period from the beginning of 1913 to the end of 1935. Does this period favor stocks or does it favor bonds? If the decision is to be made solely upon the basis of wholesale commodity prices, the period favors stocks, since wholesale commodity prices were about 15 per cent higher at the end of 1935 than at the beginning of 1913.[1] That is, the period favors stocks if we assume that the secular trend of wholesale commodity prices increases less than 15 per cent over a period of twenty-three years. But if the decision is to be made solely on the basis of profits as indicated by volume of industrial production, the period favors bonds, since industrial production was about 115.4 per cent of normal at the beginning of 1913 and only about 76.9 per cent of normal at the end of 1936.[2] Because of the fact that industrial activity was so much greater during 1913 than during 1935, it appears to the writer that the period under discussion favors bonds even though wholesale commodity prices were some 15 per cent higher at the end of 1935 than at the beginning of 1913. It must be admitted, however, that since there are so many different factors that affect security prices and that since some of these factors cannot be measured, the proof of the opinion expressed above would be very difficult to establish.

In an attempt to eliminate any possible advantage to bonds over stocks that may exist in Tests No. 1–7, calculations have been made which show what the yields on the securities used in these tests would have been if the beginning date of each of the seven tests had been advanced from the beginning of 1913 to the

[1] United States Bureau of Labor Statistics, *Index of Wholesale Commodity Prices.*

[2] *Standard Index of Industrial Production.*

beginning of 1915. It will be recalled that the beginning of 1915 marks approximately the low point of a minor business recession and that at this time stock prices were somewhat depressed. The period extending from the beginning of 1915 to the end of 1935 does not appear to the writer to favor bonds but appears to slightly favor stocks, since wholesale commodity prices during this period favor stocks and the volume of industrial production was about the same percentage of normal at the beginning of the period as at the end. Wholesale commodity prices were about 19 per cent higher at the end of 1935 than at the beginning of 1915,[3] while industrial production was about 73.6 per cent of normal at the beginning of 1915 and about 76.9 per cent of normal at the end of 1935.[4]

The last nine tests cover the period from the beginning of 1923 to the end of 1935. It is the opinion of the writer that this period favors bonds, since both wholesale commodity prices and volume of industrial production favor bonds by considerable margins during this period. Wholesale commodity prices were about 79.7 per cent as high at the end of 1935 as they were at the beginning of 1923,[5] while industrial production was about 109.6 per cent of normal at the beginning of 1923 and only about 76.9 per cent of normal at the end of 1935.[6]

RESULTS OF TESTS NO. 1–16

TEST NO. 1 (PERIOD: 1913–35)

Railroad stocks compared with railroad bonds: fifty-two individual stock and bond investments.—By examining Table 1 one might reach the conclusion that as far as railroad securities are concerned the Common Stock Theory has not held true during the period from 1913 to 1935. Over this period the bonds in Test No. 1 show an unadjusted yield of $4\frac{1}{8}-$ per cent and a yield expressed in terms of purchasing power of $2\frac{1}{2}+$ per cent, while the corresponding yields on the stocks are only $2\frac{1}{2}-$ per cent and $\frac{7}{8}+$ per cent,

[3] United States Bureau of Labor Statistics, *op. cit.*

[4] *Standard Index of Industrial Production.*

[5] United States Bureau of Labor Statistics, *op. cit.*

[6] *Standard Index of Industrial Production.*

respectively. But when one considers the fact that the Common Stock Theory is concerned only with high-grade securities and that many of the securities used in Test No. 1 are not high grade,

TABLE 1

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 1

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913	0.84066	.....	0.84066	.....	1.00253	.....	1.00253	.....
1914	0.69934	.....	0.67897	.....	1.01544	.....	0.98586	.....
1915	0.86883	.....	0.82667	.....	1.09160	.....	1.03863	.....
1916	0.98284	.....	0.83080	.....	1.15369	.....	0.97522	.....
1917	0.68268	.....	0.47941	.....	1.06329	.....	0.74669	.....
1918	0.76347	.....	0.43777	.....	1.14908	.....	0.65888	.....
1919	0.75885	4†	0.38076	14¾+†	1.12093	1⅝+	0.56243	8⅝−†
1920	0.80405	.....	0.40122	.....	1.16566	.....	0.58167	.....
1921	0.83173	.....	0.47718	.....	1.33258	.....	0.76453	.....
1922	1.12718	1¼−	0.66500	4⅛+†	1.44728	3¾+	0.85385	1⅝−†
1923	1.13417	.....	0.65483	.....	1.49782	.....	0.86479	.....
1924	1.70356	.....	0.98757	.....	1.64628	.....	0.95437	.....
1925	2.23138	.....	1.25429	.....	1.77046	.....	0.95520	.....
1926	2.49693	.....	1.42194	.....	1.90900	.....	1.08713	.....
1927	3.24148	.....	1.88458	.....	2.07209	.....	1.20470	.....
1928	3.60691	8⅜−	2.10561	4¾+	2.07443	4⅝+	1.21099	1¼−
1929	3.57569	7¾+	2.08617	4⅜+	2.13735	4⅜−	1.24700	1¼+
1930	2.51926	.....	1.56768	.....	2.20590	4½−	1.37268	1⅜+
1931	0.91629	.....	0.62846	.....	1.76697	.....	1.21191	.....
1932‡	0.36484	5¼+†	0.26886	7−†	1.56730	2⅜−	1.15497	¾−
1932	0.76845	.....	0.58172	.....	1.75621	.....	1.32945	.....
1933	1.58507	.....	1.17413	.....	2.07283	.....	1.53543	.....
1934	1.35397	.....	0.97760	.....	2.41508	.....	1.74374	.....
1935	1.75241	2½−	1.23933	⅞+	2.51238	4⅛−	1.77679	2½+

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

it becomes evident that this test does not furnish suitable data upon which to make an assumption regarding the validity of the theory. Moreover, the test may not make a fair comparison between stocks and bonds, since it seems to favor bonds.

Since the period covered by Test No. 1 appears to favor bonds, it might be of interest to see what the stock and bond yields would

have been in this test with the beginning date advanced to the beginning of 1915. As stated before, it is the opinion of the writer that the period extending from the beginning of 1915 to the end of 1935 does not favor bonds but that it perhaps slightly favors stocks. With the beginning date of the test advanced to the beginning of 1915 the stock yields would have been somewhat better than the bonds yields. The unadjusted and adjusted stock yields would have been $5\frac{1}{8}+$ per cent and $3\frac{3}{8}-$ per cent, respectively, while the corresponding bond yields would have been $4\frac{3}{8}+$ per cent and $2\frac{7}{8}-$ per cent, respectively. It is apparent, therefore, that whether the beginning date of the test is the beginning of 1913 or the beginning of 1915, the yields on both the stocks and the bonds are unusually poor. This is especially noticeable if purchasing-power yields are considered.

TEST NO. 2 (PERIOD: 1913–35)

Industrial stocks compared with industrial bonds: twenty-four individual stock and bond investments.—Although the original investment in Test No. 2 was in the stocks and bonds of twenty-four different companies, the actual number of companies represented in the test is considerably more. It was necessary to make numerous substitutions of securities, especially because of matured and called bonds. A considerable number of the securities used are high grade and represent some of the largest and most prosperous industrial companies in the United States. On the other hand, a number of the securities used are highly speculative and not suitable to test the Common Stock Theory.

Test No. 2 shows the stocks to be a somewhat better investment than the bonds. The bonds are superior only at the end of 1913 and the end of 1914, during the temporary business recession that took place at that time, and upon July 1, 1932, the date which marks approximately the low point of stock prices during the recent depression. Table 2 shows that by the end of 1935 stocks had re-established their superiority over bonds by a considerable margin. The yield on both stocks and bonds at the end of 1935 is highly satisfactory, not only the unadjusted yield, but, what is more important, the yield in terms of buying-power. The unad-

justed and adjusted yields for the stocks at this time were $9\frac{3}{4}-$ per cent and 8+ per cent, respectively, and the corresponding yields for the bonds were 7− per cent and $5\frac{3}{8}+$ per cent, respectively.

TABLE 2

INDEXES AND YIELDS OF INDUSTRIAL STOCKS AND BONDS USED IN TEST NO. 2

END OF YEAR	STOCKS				BONDS			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913	0.86113	.....	0.87113	.....	1.03099	.....	1.03099	.....
1914	0.89008	.....	0.86416	.....	1.07661	.....	1.04525	.....
1915	1.94026	.....	1.84611	.....	1.20263	.....	1.14427	.....
1916	2.31772	.....	1.95919	.....	1.29450	.....	1.09425	.....
1917	1.73770	.....	1.22029	.....	1.26205	.....	0.88627	.....
1918	2.14910	.....	1.23228	.....	1.38652	.....	0.79502	.....
1919	3.27330	$18\frac{1}{2}-$	1.64240	$7\frac{3}{8}-$	1.45554	$5\frac{1}{2}+$	0.73033	$4\frac{5}{8}-$†
1920	2.27251	.....	1.13399	.....	1.42827	.....	0.71271	.....
1921	2.52938	.....	1.45116	.....	1.66912	.....	0.95761	.....
1922	3.05334	$11\frac{3}{4}+$	1.80138	6+	1.83370	$6\frac{1}{4}+$	1.08183	$\frac{3}{4}+$
1923	2.96197	.....	1.71014	.....	1.90128	.....	1.09774	.....
1924	3.60347	.....	2.08897	.....	2.06245	.....	1.19562	.....
1925	4.16261	.....	2.33986	.....	2.29628	.....	1.29189	.....
1926	4.31129	.....	2.45518	.....	2.46916	.....	1.40613	.....
1927	6.36441	.....	3.70024	.....	2.64229	.....	1.53622	.....
1928	8.10432	14−	4.73107	$10\frac{1}{4}-$	2.71761	$6\frac{1}{2}-$	1.58646	$2\frac{7}{8}+$
1929	7.66838	$12\frac{3}{4}-$	4.47398	$9\frac{1}{4}-$	2.72893	$6\frac{1}{8}-$	1.59214	$2\frac{3}{4}+$
1930	6.00812	.....	3.73872	.....	2.77765	$5\frac{7}{8}-$	1.72847	$3\frac{1}{8}-$
1931	3.42709	.....	2.35054	.....	2.46936	.....	1.69366	.....
1932‡	2.02507	$3\frac{5}{8}+$	1.49231	$2\frac{1}{8}-$	2.26134	$4\frac{1}{4}+$	1.66643	$2\frac{5}{8}+$
1932	3.37509	.....	2.55495	.....	2.63953	.....	1.99813	.....
1933	5.51288	.....	4.08361	.....	3.14564	.....	2.33010	.....
1934	5.11239	.....	3.69126	.....	3.97786	.....	2.87210	.....
1935	8.39965	$9\frac{3}{4}-$	5.94035	8+	4.72164	7−	3.33921	$5\frac{3}{8}+$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

With the beginning date for the test advanced to the beginning of 1915, in an attempt to eliminate any advantage to bonds, the test shows at the end of 1935 an unadjusted stock yield of $13\frac{1}{4}+$ per cent and an adjusted stock yield of $11\frac{5}{8}-$ per cent, with corresponding bond yields of $7\frac{3}{8}+$ per cent and $5\frac{3}{4}+$ per cent, respectively.

TEST NO. 3 (PERIOD: 1913–35)

Public utility stocks compared with public utility bonds: sixteen individual stock and bond investments.—Judged on the basis of ability to pay dividends, practically all the stocks in Test No. 3, with the exception of several street-railway stocks, were high-grade securities. The yields on the stocks and the yields on the bonds at the end of 1935, although not as high as the corresponding yields on the industrial securities in Test No. 2, were satisfactory from an investment point of view. At the end of 1935 the unadjusted and adjusted stock yields were $6\frac{1}{2}+$ per cent and $4\frac{7}{8}+$ per cent, respectively, and the unadjusted and adjusted bond yields were $5\frac{3}{4}-$ per cent and $4\frac{1}{8}+$ per cent, respectively. As can be seen, stocks showed a yield somewhat higher than bonds. If the test had commenced at the beginning of 1915, the unadjusted and adjusted stock yields would have been $7\frac{1}{2}+$ per cent and $5\frac{7}{8}+$ per cent, respectively, and the unadjusted and adjusted bond yields would have been 6+ per cent and $4\frac{1}{2}-$ per cent, respectively.

TESTS NO. 1, 2, AND 3 COMBINED

It will be recalled that Test No. 1, which compared railroad stocks with railroad bonds, showed the bonds to be a better investment than the stocks at the end of 1935. On the other hand, Tests No. 2 and 3, which compared industrial and public utility stocks with industrial and public utility bonds, respectively, showed the stocks to be better invesments than the bonds. These three tests were combined in an attempt to find out whether the combined stocks of the three tests would have been a better or a poorer investment than the combined bonds. There were, in all, ninety-two individual stock investments in the stock average and, of course, the same number in the bond average. Each individual stock and bond investment was given equal weight in the average. The unadjusted and adjusted yields for the combined railroad, industrial, and public utility stocks for the period extending from the beginning of 1913 to the end of 1935 were $6\frac{1}{8}-$ per cent and $4\frac{1}{2}+$ per cent, respectively, while the corresponding unadjusted and adjusted yields on the bonds of the same companies were $5\frac{1}{4}+$ per cent and $3\frac{3}{4}-$ per cent, respectively. When the beginning

date of the test was advanced to the beginning of 1915, the unadjusted and adjusted stock yields were $8\frac{7}{8}+$ per cent and $7\frac{1}{4}+$ per cent, respectively, while the corresponding yields for the bonds were $5\frac{5}{8}+$ per cent and $4\frac{1}{8}-$ per cent, respectively.

TABLE 3

INDEXES AND YIELDS OF PUBLIC UTILITY STOCKS AND BONDS USED IN TEST NO. 3

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913	0.94207	.....	0.94207	.....	1.01555	.....	1.01555	.....
1914	0.93359	.....	0.90640	.....	1.05520	.....	1.02447	.....
1915	1.15947	.....	1.10321	.....	1.14613	.....	1.09051	.....
1916	1.25690	.....	1.06247	.....	1.21936	.....	1.03074	.....
1917	0.91795	.....	0.64463	.....	1.12120	.....	0.78736	.....
1918	0.93628	.....	0.53686	.....	1.18646	.....	0.68031	.....
1919	0.90253	$1\frac{1}{2}-$†	0.45285	12−†	1.09238	$1\frac{1}{4}+$	0.54811	9−†
1920	0.91235	.....	0.45526	.....	1.05248	.....	0.52519	.....
1921	1.10149	.....	0.63195	.....	1.30310	.....	0.74762	.....
1922	1.61268	$4\frac{7}{8}+$	0.95143	$\frac{1}{2}-$†	1.50448	$4\frac{1}{8}+$	0.88760	$1\frac{1}{4}-$†
1923	1.77357	.....	1.02400	.....	1.58647	.....	0.91598	.....
1924	2.68048	.....	1.55390	.....	1.77403	.....	1.02842	.....
1925	3.67097	.....	2.06350	.....	1.90515	.....	1.07091	.....
1926	3.76093	.....	2.14176	.....	2.05283	.....	1.16904	.....
1927	5.01595	.....	2.91625	.....	2.20564	.....	1.28235	.....
1928	7.09765	13+	4.14340	$9\frac{1}{4}+$	2.28315	$5\frac{1}{4}+$	1.33284	$1\frac{3}{4}+$
1929	8.02771	13+	4.68361	$9\frac{1}{2}+$	2.33035	$5\frac{1}{8}-$	1.35960	$1\frac{7}{8}-$
1930	6.42839	.....	4.00024	.....	2.49224	$5\frac{1}{4}-$	1.55086	$2\frac{1}{2}-$
1931	3.89173	.....	2.66922	.....	2.30104	.....	1.57822	.....
1932‡	2.14566	4−	1.58118	$2\frac{3}{8}+$	2.24157	$4\frac{1}{4}-$	1.65186	$2\frac{5}{8}-$
1932	3.43316	.....	2.59891	.....	2.47792	.....	1.87579	.....
1933	2.90168	.....	2.14940	.....	2.59340	.....	1.92104	.....
1934	2.43278	.....	1.75652	.....	3.10367	.....	2.24092	.....
1935	4.25742	$6\frac{1}{2}+$	3.01091	$4\frac{7}{8}+$	3.58493	$5\frac{3}{4}-$	2.53531	$4\frac{1}{8}+$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

TESTS NO. 4 AND 5 (PERIOD: 1913–35)

Railroad stocks compared with railroad bonds in Test No. 4: twenty-six individual stock and bond investments; railroad stocks compared with railroad bonds in Test No. 5: twenty-seven individual

stock and bond investments.—So many of the securities used in Tests No. 4 and 5 are the same, and the results of these tests are so much alike, that it was thought best to discuss them together.

TABLE 4

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 4

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913	0.93719	.....	0.93719	.....	1.00730	.....	1.00730	.....
1914	0.89019	.....	0.86426	.....	1.02745	.....	0.99752	.....
1915	1.04954	.....	0.99861	.....	1.10387	.....	1.05030	.....
1916	1.11095	.....	0.93910	.....	1.16339	.....	0.98342	.....
1917	0.87472	.....	0.61427	.....	1.08073	.....	0.75894	.....
1918	0.99839	.....	0.57247	.....	1.15571	.....	0.66268	.....
1919	0.95907	$\frac{5}{8}$—†	0.48122	11+†	1.13105	$1\frac{3}{4}$+	0.56751	$8\frac{3}{8}$+†
1920	1.04196	.....	0.51994	.....	1.16563	.....	0.58165	.....
1921	1.11208	.....	0.63803	.....	1.32378	.....	0.75948	.....
1922	1.35826	$3\frac{1}{8}$—	0.80133	$2\frac{1}{4}$—†	1.43816	$3\frac{3}{4}$—	0.84847	$1\frac{5}{8}$+†
1923	1.34151	.....	0.77456	.....	1.47476	.....	0.85148	.....
1924	1.80826	.....	1.04827	.....	1.60755	.....	0.93191	.....
1925	2.19631	.....	1.23458	.....	1.71244	.....	0.96259	.....
1926	2.54239	.....	1.44783	.....	1.83977	.....	1.04771	.....
1927	3.07111	.....	1.78553	.....	2.00111	.....	1.16344	.....
1928	3.36063	$7\frac{7}{8}$—	1.96184	$4\frac{1}{4}$+	1.99696	$4\frac{3}{8}$+	1.16577	1—
1929	3.47740	$7\frac{5}{8}$—	2.02882	$4\frac{1}{4}$—	2.08872	$4\frac{3}{8}$+	1.21862	$1\frac{1}{8}$+
1930	2.71088	.....	1.68692	.....	2.20210	$4\frac{1}{2}$—	1.37032	$1\frac{3}{4}$+
1931	1.34519	.....	0.92263	.....	1.87843	.....	1.28836	.....
1932‡	0.54478	$3\frac{1}{8}$+†	0.40146	$4\frac{3}{4}$+†	1.71685	$2\frac{3}{8}$+	1.26518	$1\frac{1}{4}$—
1932	1.24611	.....	0.94331	.....	1.94717	.....	1.47401	.....
1933	2.08586	.....	1.54508	.....	2.21640	.....	1.64178	.....
1934	2.03148	.....	1.46677	.....	2.48744	.....	1.79599	.....
1935	2.50094	$4\frac{1}{8}$—	1.76870	$2\frac{1}{2}$+	2.51668	$4\frac{1}{8}$—	1.77983	$2\frac{1}{2}$+

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

The investment first made in Test No. 4 was made in the stocks and bonds of twenty-six railroad companies that paid dividends in 1912 and in each of the four preceding years. The first investment in Test No. 5 was made in the stocks and bonds of twenty-seven railroad companies whose stocks sold for more than $50 a share

at the beginning of 1913. For convenience the stocks and bonds used in Tests No. 4 and 5 will be at times referred to as high-grade railroad stocks and high-grade railroad bonds.

TABLE 5

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 5

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912....	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913....	0.93076	.....	0.93076	.....	1.00549	.....	1.00549	.....
1914....	0.87366	.....	0.84821	.....	1.02250	.....	0.99272	.....
1915....	1.03974	.....	0.98929	.....	1.09899	.....	1.04566	.....
1916....	1.10080	.....	0.93052	.....	1.15651	.....	0.97761	.....
1917....	0.84993	.....	0.59686	.....	1.06915	.....	0.75081	.....
1918....	0.98393	.....	0.56418	.....	1.14454	.....	0.65627	.....
1919....	0.95231	$\frac{3}{4}-$†	0.47783	$11\frac{1}{8}+$†	1.12168	$1\frac{5}{8}+$	0.56281	$8\frac{1}{2}+$†
1920....	1.03799	.....	0.51796	.....	1.16198	.....	0.57983	.....
1921....	1.11046	.....	0.63710	.....	1.31982	.....	0.75721	.....
1922....	1.38946	$3\frac{3}{8}-$	0.81974	2+†	1.43694	$3\frac{3}{4}-$	0.84775	$1\frac{5}{8}+$†
1923....	1.41744	.....	0.81838	.....	1.47353	.....	0.85077	.....
1924....	1.93254	.....	1.12031	.....	1.60485	.....	0.93035	.....
1925....	2.38933	.....	1.34307	.....	1.71015	.....	0.96130	.....
1926....	2.78294	.....	1.58482	.....	.184024	.....	1.04797	.....
1927....	3.38235	.....	1.96648	.....	2.00623	.....	1.16641	.....
1928....	3.66821	$8\frac{1}{2}-$	2.14140	$4\frac{7}{8}-$	2.00108	$4\frac{3}{8}+$	1.16817	1−
1929....	3.80421	$8\frac{1}{8}$	2.21949	$4\frac{3}{4}+$	2.08953	$4\frac{3}{8}+$	1.21910	$1\frac{1}{8}+$
1930....	2.93884	.....	1.82877	.....	2.20261	$4\frac{1}{2}-$	1.37063	.....
1931....	1.35550	.....	0.92970	.....	1.88212	.....	1.29089	.....
1932‡...	0.55031	$3\frac{1}{8}-$†	0.40553	$4\frac{3}{4}-$†	1.71926	$2\frac{7}{8}-$	1.26696	$1\frac{1}{4}-$
1932.....	1.22255	.....	0.92547	.....	1.94347	.....	1.47121	.....
1933....	2.10124	.....	1.55647	.....	2.22768	.....	1.65013	.....
1934....	2.02316	.....	1.46077	.....	2.51552	.....	1.81626	.....
1935....	2.52748	$4\frac{1}{8}-$	1.78747	$2\frac{1}{2}+$	2.58565	$4\frac{1}{4}-$	1.82861	$2\frac{5}{8}+$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

It can be seen by examining Tables 4 and 5 that the yields on the dividend-paying and high-priced railroad stocks at the end of 1935 are almost identically the same. In each case the unadjusted stock yield is $4\frac{1}{8}-$ per cent and the adjusted stock yield $2\frac{1}{2}+$ per cent. This similarity of yield is easy to understand, however,

when one considers that the stocks used in the two tests were practically identical. It does, however, appear to be somewhat of a coincidence that the bond yields in each of the two tests are practically the same as the stock yields. The unadjusted and adjusted yields at the end of 1935 for the bonds of the dividend-paying companies are $4\frac{1}{8}-$ per cent and $2\frac{1}{2}+$ per cent, respectively, and for the bonds of the companies whose stock sold for more than $50 a share at the beginning of 1913, $4\frac{1}{4}-$ per cent and $2\frac{5}{8}+$ per cent, respectively. If the beginning date of the tests had been advanced to the beginning of 1915, however, the stocks would have shown yields somewhat higher than the bonds. The unadjusted and adjusted yields on the dividend-paying stocks at the end of 1935 would have been $5\frac{1}{8}-$ per cent and $3\frac{1}{2}+$ per cent, respectively, and on the high-priced stocks $5\frac{1}{4}+$ per cent and $3\frac{3}{4}-$ per cent, respectively, while the corresponding yields on the bonds of the dividend-paying companies would have been $4\frac{3}{8}-$ per cent and $2\frac{3}{4}+$ per cent, respectively, and on the bonds of the companies, whose stocks sold for more than $50 a share at the beginning of 1913, $4\frac{1}{2}+$ per cent and $3-$ per cent, respectively.

Since in both Test No. 4 and Test No. 5 high-grade railroad stocks show a higher yield between 1915 and 1935 than high-grade railroad bonds, some might conclude that the Common Stock Theory has held true for railroad stocks during this period. It appears to the writer, however, that such a conclusion is not warranted. In the first place, it is probable that the period under discussion slightly favors stocks. In the second place, even though the high-grade railroad stocks do show a slightly higher yield than the high-grade railroad bonds from 1915 to 1935, they show a lower yield than the industrial bonds in Test No. 2 and a lower yield than the public utility bonds in Test No. 3. The yield on the high-grade railroad stocks is also less than the combined yield on the railroad, industrial, and public utility bonds of Tests No. 1, 2, and 3. Since, therefore, high-grade railroad stocks have shown themselves to be a poorer investment than a diversified holding of railroad, industrial, and public utility bonds during a period which appears to slightly favor stocks, it seems to the writer that one would be justified in drawing the conclusion that the Common

Stock Theory has not held true as far as railroad stocks are concerned during this period, that is, from the beginning of 1915 to the end of 1935.

TESTS NO. 6 AND 7 (PERIOD: 1913–35)

Railroad stocks compared with railroad bonds in Test No. 6: twenty-one individual stock and bond investments; railroad stocks compared with railroad bonds in Test No. 7: twenty-five individual stock and bond investments.—As in Tests No. 4 and 5, the securities used in Tests No. 6 and 7 were so nearly identical that a separate discussion of the results of these tests appeared unnecessary. The initial investment in Test No. 6 was made in the stocks and bonds of twenty-one railroad companies that paid no dividends in 1912 or in any of the four preceding years. The initial investment in Test No. 7 was made in the stocks and bonds of twenty-five railroad companies whose stocks sold for less than $50 a share at the beginning of 1913. For convenience, the stocks and bonds used in Tests No. 6 and 7 will be at times referred to as speculative railroad stocks and speculative railroad bonds.

The stock investments in Tests No. 6 and 7 turned out very much the same. The unadjusted yield on the non–dividend-paying stocks was slightly less than $\frac{1}{8}$ per cent at the end of 1935, while the adjusted yield in terms of purchasing power showed a compound discount of over $1\frac{3}{8}$ per cent. For the low-priced stocks the yields were $\frac{3}{8}+$ per cent discount and $1\frac{7}{8}+$ per cent discount, respectively. The unadjusted and adjusted bond yields for Test No. 6 were $4+$ per cent and $2\frac{1}{2}-$ per cent, respectively, and for Test No. 7, $4-$ per cent and $2\frac{3}{8}+$ per cent, respectively. These results seem to indicate that low-grade railroad stocks were, in the aggregate, an unusually poor investment from 1913 to 1935; and, judging from the results of the tests, low-grade railroad stocks appear to have been a much poorer investment than high-grade railroad stocks during the same period. On the other hand, the tests seem to indicate that from 1913 to 1935 the yield on low-grade railroad bonds were, in the aggregate, about the same as the yield on high-grade railroad bonds.

If the beginning date of the tests had been advanced to the beginning of 1915, the unadjusted and adjusted yields on the non–

dividend-paying railroad stocks would have been $5\frac{3}{4}-$ per cent and $4\frac{1}{8}+$ per cent, respectively, while the corresponding yields on the bonds of the same companies would have been $4\frac{3}{8}+$ per cent and $2\frac{7}{8}-$ per cent, respectively; and the unadjusted and adjusted

TABLE 6

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 6

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913	0.72890	.....	0.72890	.....	0.99981	.....	0.99981	.....
1914	0.48687	.....	0.47269	.....	1.00912	.....	0.97973	.....
1915	0.66750	.....	0.63511	.....	1.08784	.....	1.03505	.....
1916	0.83984	.....	0.70992	.....	1.15350	.....	0.97506	.....
1917	0.48460	.....	0.34031	.....	1.05902	.....	0.74369	.....
1918	0.51789	.....	0.29696	.....	1.16059	.....	0.66548	.....
1919	0.55898	$8\frac{5}{8}+\dagger$	0.28047	$19\frac{7}{8}+\dagger$	1.12854	$1\frac{3}{4}-$	0.56625	$8\frac{1}{2}-\dagger$
1920	0.54544	.....	0.27218	.....	1.18309	.....	0.59036	.....
1921	0.50194	.....	0.28797	.....	1.35435	.....	0.77702	.....
1922	0.86945	$1\frac{3}{8}+\dagger$	0.51295	$6\frac{7}{8}+\dagger$	1.46884	$3\frac{7}{8}+$	0.86657	$1\frac{1}{2}-\dagger$
1923	0.88409	.....	0.51044	.....	1.53319	.....	0.88521	.....
1924	1.54854	.....	0.89770	.....	1.69383	.....	0.98193	.....
1925	2.22137	.....	1.24866	.....	1.84145	.....	1.03510	.....
1926	2.34090	.....	1.33309	.....	1.98267	.....	1.12908	.....
1927	3.32740	.....	1.93453	.....	2.14314	.....	1.24601	.....
1928	3.85722	$8\frac{3}{4}+$	2.25173	$5\frac{1}{4}-$	2.15470	$4\frac{7}{8}+$	1.25785	$1\frac{1}{2}-$
1929	3.72809	8+	2.17508	$4\frac{5}{8}+$	2.19777	$4\frac{3}{4}-$	1.28225	$1\frac{1}{2}-$
1930	2.34864	.....	1.46151	.....	2.23574	$4\frac{5}{8}-$	1.39125	$1\frac{7}{8}-$
1931	0.48181	.....	0.33046	.....	1.61395	.....	1.10696	.....
1932‡	0.17596	$9\frac{3}{8}-\dagger$	0.12967	$11+\dagger$	1.38401	$1\frac{5}{8}+$	1.01990	$\frac{1}{8}-$
1932	0.28153	.....	0.21312	.....	1.53381	.....	1.16110	.....
1933	0.99111	.....	0.73416	.....	1.90021	.....	1.40756	.....
1934	0.69917	.....	0.50482	.....	2.29568	.....	1.65753	.....
1935	1.02799	$\frac{1}{8}-$	0.72701	$1\frac{3}{8}+\dagger$	2.47692	4+	1.75171	$2\frac{1}{2}-$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

yields on the low-priced railroad stocks would have been 5+ per cent and $3\frac{1}{2}-$ per cent, respectively, while the corresponding yields on the bonds of the same companies would have been $4\frac{3}{8}-$ per cent and $2\frac{3}{4}+$ per cent, respectively. In other words, the speculative railroad stocks would have shown a yield somewhat

higher than the yield on the speculative railroad bonds. It might be added that, with the beginning date of the tests advanced to the beginning of 1915, the yield on the speculative railroad stocks

TABLE 7

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 7

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1912	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1913	0.74336	.....	0.74336	.....	0.99933	.....	0.99933	.....
1914	0.51108	.....	0.49619	.....	1.00781	.....	0.97846	.....
1915	0.68424	.....	0.65104	.....	1.08362	.....	1.03104	.....
1916	0.85545	.....	0.72312	.....	1.15064	.....	0.97265	.....
1917	0.50204	.....	0.35256	.....	1.05695	.....	0.74224	.....
1918	0.52536	.....	0.30124	.....	1.15397	.....	0.66168	.....
1919	0.54992	$8\frac{7}{8}$+†	0.27593	$20\frac{1}{4}$—†	1.12012	$1\frac{5}{8}$+	0.56203	$8\frac{5}{8}$—†
1920	0.55139	.....	0.27514	.....	1.16965	.....	0.58366	.....
1921	0.53070	.....	0.30448	.....	1.34637	.....	0.77244	.....
1922	0.84392	$1\frac{3}{4}$—†	0.49789	$7\frac{1}{4}$—†	1.45964	$3\frac{7}{8}$—	0.86114	$1\frac{1}{2}$+†
1923	0.82825	.....	0.47820	.....	1.52406	.....	0.87994	.....
1924	1.45626	.....	0.84421	.....	1.69101	.....	0.98030	.....
1925	2.06080	.....	1.15840	.....	1.83523	.....	1.03161	.....
1926	2.18805	.....	1.24604	.....	1.98326	.....	1.12942	.....
1927	3.08934	.....	1.79613	.....	2.14322	.....	1.24606	.....
1928	3.54071	$8\frac{1}{4}$—	2.06696	$4\frac{5}{8}$+	2.15366	$5\frac{7}{8}$+	1.25724	$1\frac{1}{2}$—
1929	3.32888	$7\frac{3}{8}$—	1.94217	4—	2.18899	$4\frac{3}{4}$—	1.27712	$1\frac{1}{2}$—
1930	2.06611	.....	1.28569	.....	2.20945	$4\frac{1}{2}$+	1.37489	$1\frac{3}{4}$+
1931	0.44194	.....	0.30311	.....	1.64619	.....	1.12907	.....
1932‡	0.16454	$9\frac{3}{4}$—†	0.12125	$11\frac{3}{8}$+†	1.40318	$1\frac{3}{4}$+	1.03403	$\frac{1}{8}$+
1932	0.30162	.....	0.22833	.....	1.55396	.....	1.17635	.....
1933	0.90761	.....	0.67230	.....	1.90559	.....	1.41155	.....
1934	0.63125	.....	0.45578	.....	2.30661	.....	1.66542	.....
1935	0.91534	$\frac{3}{8}$+†	0.64734	$1\frac{7}{8}$+†	2.43324	4—	1.72082	$2\frac{3}{8}$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † Discount. ‡ July 1.

would have been about the same as the yield on the high-grade railroad stocks.

TEST NO. 8 (PERIOD: 1923–35)

Railroad stocks compared with railroad bonds: nine individual stock and bond investments.—At the end of 1935 the bonds in Test

No. 8 had shown themselves to be a better investment than the stocks. The bonds showed unadjusted and adjusted yields of $3\frac{3}{4}+$ per cent and $5\frac{1}{4}-$ per cent, respectively; the corresponding yields on the stocks were $4\frac{1}{4}-$ per cent discount and $2\frac{5}{8}+$ per cent discount, respectively. It will be recalled that it is the opinion of the writer that this test and the remaining tests of this study favor bonds, since wholesale commodity prices were higher at the beginning of 1923 than they were at the end of 1935 and since industrial production was above normal at the beginning of 1923 and below normal at the end of 1935. The fact that Test No. 8 and most of the other tests covering the period from 1923 to 1935 show bonds to be better investments than stocks does not in any sense refute the theory of the long-term superiority of stocks over bonds, since the period covered by these tests is relatively short and appears to favor bonds.

TEST NO. 9 (PERIOD: 1923–35)

Industrial stocks compared with industrial bonds: twenty-three individual stock and bond investments.—Test No. 9, like Test No. 8, shows bonds to be a better investment than stocks at the end of 1935. By comparing Tables 8 and 9 it can be seen that at the end of 1935 the industrial stocks show higher yields than the railroad stocks and the industrial bonds higher yields than the railroad bonds. Another thing worthy of note in Test No. 9 is the unusually high bond yield at the end of 1935. This can, of course, be partly explained in the case of the adjusted bond yield by the fact that the cost of living was lower in 1935 than in 1923. The high yield rate at which most of the bonds were purchased and the subsequent appreciation in value of many of these bonds were also important contributing factors.

TEST NO. 10 (PERIOD: 1923–35)

Public utility stocks compared with public utility bonds: four individual stock and bond investments.—Test No. 10 is important because it shows what a distorted picture one might get as to the investment value of a certain type of security by using too small a number of securities in the investment average. It so happened that all four of the individual stock investments used in this test

turned out to be unusually good investnents, one of them almost unbelievably good. The unadjusted and adjusted yields of the stocks at the end of 1935 were $18\frac{1}{2}+$ per cent and $20\frac{1}{4}-$ per cent, respectively. The yield on the bonds was also very good, being slightly better than the yield shown on the industrial bonds in Test No. 9.

TABLE 8

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 8

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922....	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923....	1.02829	.....	1.00632	.....	1.00512	.....	0.98365	.....
1924....	1.49616	.....	1.47014	.....	1.11205	.....	1.09271	.....
1925....	1.98114	.....	1.88759	.....	1.21070	.....	1.15353	.....
1926....	2.18006	.....	2.10433	.....	1.32258	.....	1.27663	.....
1927....	2.89913	.....	2.85699	.....	1.46624	.....	1.44493	.....
1928....	3.06055	$20\frac{1}{2}-$	3.02839	$20\frac{1}{4}+$	1.46449	$6\frac{5}{8}-$	1.44910	$6\frac{3}{8}+$
1929....	3.16305	$17\frac{7}{8}+$	3.12799	$17\frac{3}{4}-$	1.48096	$5\frac{3}{4}+$	1.46454	$5\frac{5}{8}-$
1930....	1.95482	.....	2.06187	.....	1.41707	$4\frac{1}{2}-$	1.49467	$5\frac{1}{8}$
1931....	0.62225	.....	0.72340	.....	0.89696	.....	1.04276	.....
1932†...	0.19587	$18\frac{3}{4}-\ddagger$	0.24466	$16-\ddagger$	0.72298	$3\frac{1}{2}-\ddagger$	0.90306	$1.\frac{1}{8}-\ddagger$
1932....	0.31234	.....	0.40077	.....	0.90596	.....	1.16246	.....
1933....	0.54475	.....	0.68396	.....	1.09489	.....	1.37470	.....
1934....	0.41271	.....	0.50508	.....	1.38165	.....	1.69090	.....
1935....	0.59221	$4\frac{1}{4}-\ddagger$	0.70990	$2\frac{5}{8}+\ddagger$	1.61715	$3\frac{3}{4}+$	1.93852	$5\frac{1}{4}-$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

TESTS NO. 8, 9, AND 10 COMBINED

The nine railroad, twenty-three industrial, and four public utility individual stock investments of Tests No. 8, 9, and 10 were combined into a single stock average and the bonds of the same companies into a single bond average. The unadjusted and adjusted yields on the stocks at the end of 1935 were 5+ per cent and $6\frac{1}{2}+$ per cent, respectively, and the unadjusted and adjusted yields on the bonds were 7− per cent and $8\frac{1}{2}+$ per cent, respectively. The fact that yields on the bonds were somewhat higher than the yields on the stocks by no means refutes the theory that

a diversified holding of stocks is a better long-term investment than a diversified holding of bonds, since the period under discussion is of relatively short duration (1923–35) and appears to have favored bonds.

TESTS NO. 11, 12, AND 13 (PERIOD: 1923–35)

Tests No. 1, 2, and 3 adjusted to base beginning of 1923.—Tests No. 11, 12, and 13 are, in a sense, not new. They are simply Tests

TABLE 9

INDEXES AND YIELDS OF INDUSTRIAL STOCKS AND BONDS USED IN TEST NO. 9

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922....	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923....	0.98628	.....	0.96521	.....	1.05163	.....	1.02916	.....
1924....	0.98334	.....	0.96624	.....	1.15437	.....	1.13429	.....
1925....	1.28070	.....	1.22023	.....	1.26732	.....	1.20748	.....
1926....	1.42401	.....	1.37454	.....	1.35379	.....	1.30676	.....
1927....	1.83179	.....	1.80516	.....	1.43430	.....	1.41345	.....
1928....	2.63635	$17\frac{1}{2}+$	2.60865	$17\frac{3}{8}-$	1.51639	$7\frac{1}{8}+$	1.50046	$7-$
1929....	1.74442	$8\frac{1}{4}+$	1.72508	$8\frac{1}{8}-$	1.55592	$6\frac{1}{2}+$	1.53867	$6\frac{3}{8}-$
1930....	1.01450	.....	1.07006	.....	1.57165	$5\frac{7}{8}-$	1.65772	$6\frac{1}{2}+$
1931....	0.51041	.....	0.56338	.....	1.30168	.....	1.51326	.....
1932†...	0.29251	$13\frac{7}{8}-‡$	0.36537	$11\frac{1}{8}+‡$	1.11737	$1\frac{1}{8}+$	1.39568	$3\frac{5}{8}-$
1932....	0.39077	.....	0.50141	.....	1.44523	.....	1.85440	.....
1933....	0.69348	.....	0.87070	.....	1.80222	.....	2.26279	.....
1934....	0.60943	.....	0.74584	.....	2.23560	.....	2.73598	.....
1935....	1.15151	$1\frac{1}{8}-$	1.38034	$2\frac{1}{2}+$	2.67061	$7\frac{7}{8}-$	3.20133	$9\frac{3}{8}-$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

No. 1, 2, and 3 with the beginning date of the tests advanced to 1923. The securities used in Tests No. 11, 12, and 13 are, therefore, the same as the securities used in Tests No. 1, 2, and 3 from the beginning of 1923 to the end of 1935. The investment relatives of the individual stock and bond investments, however, have been adjusted so that at the beginning of 1923 each of the relatives equals 1.

The two principal reasons for making Tests No. 11, 12, and 13 were: first, to make it possible to compare different groups of the same types of securities over the same period of time; in other words, to compare Tests No. 11, 12, and 13 with Tests No. 8, 9, and 10, respectively; second, to make possible Tests No. 14, 15,

TABLE 10

INDEXES AND YIELDS OF PUBLIC UTILITY STOCKS AND BONDS USED IN TEST NO. 10

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923	1.20882	.....	1.18300	.....	1.05851	.....	1.03590	.....
1924	2.63095	.....	2.58519	.....	1.16538	.....	1.14511	.....
1925	4.69523	.....	4.47352	.....	1.26374	.....	1.20407	.....
1926	4.85100	.....	4.68248	.....	1.34816	.....	1.30133	.....
1927	8.98798	.....	8.85733	.....	1.44058	.....	1.41964	.....
1928	11.90212	51⅛−	11.77705	50⅞−	1.49858	7−	1.48283	6¾+
1929	16.50235	49¼+	16.31941	49+	1.57207	6⅝+	1.55464	6½+
1930	11.87397	.....	12.52422	.....	1.67348	6⅝+	1.76513	7⅜−
1931	7.33989	.....	8.53297	.....	1.45496	.....	1.69146	.....
1932†	3.85865	15¼+	4.81976	18+	1.30746	2⅞−	1.63312	5¼+
1932	5.77808	.....	7.41397	.....	1.58686	.....	2.03613	.....
1933	6.76520	.....	8.49409	.....	1.87639	.....	2.35591	.....
1934	5.70132	.....	6.97742	.....	2.20588	.....	2.69961	.....
1935	9.11149	18½+	190.2217	20¼−	2.68825	7⅞+	3.22247	9⅜+

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1.

and 16, which combine the railroad, industrial, and public utility securities, respectively, of the six tests mentioned above, and thus show the effect of including larger numbers of securities in the averages.

The average unadjusted and adjusted yields of the fifty-two individual railroad-stock investments used in Test No. 11 were, at the end of 1935, ¾+ per cent and 2½− per cent, respectively. The corresponding yields for the nine individual railroad-stock investments used in Test No. 8 were 4¼− per cent discount and

$2\frac{5}{8}+$ per cent discount, respectively. These results make it apparent that in the past at least it was possible to arbitrarily select two different groups of railroad stocks and get yields that differed greatly. But, as far as bonds are concerned, Test No. 11 shows yields only slightly higher than Test No. 8, as can be seen by comparing Tables 8 and 11.

TABLE 11

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 11

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923	1.00141	.....	0.98002	.....	1.03504	.....	1.01293	.....
1924	1.63655	.....	1.60809	.....	1.14112	.....	1.12127	.....
1925	2.21256	.....	2.10808	.....	1.22850	.....	1.17049	.....
1926	2.28186	.....	2.20259	.....	1.32519	.....	1.27915	.....
1927	2.98841	.....	2.94497	.....	1.43921	.....	1.41829	.....
1928	3.37945	$22\frac{1}{2}+$	3.34394	$22\frac{1}{4}+$	1.44012	$6\frac{1}{4}+$	1.42499	$6\frac{1}{8}-$
1929	3.11906	$17\frac{5}{8}+$	3.08448	$17\frac{1}{2}-$	1.48103	$5\frac{3}{4}+$	1.46461	$5\frac{5}{8}-$
1930	1.98822	.....	2.09710	.....	1.52244	$5\frac{3}{8}+$	1.60581	$6\frac{1}{8}-$
1931	0.68282	.....	0.79381	.....	1.21453	.....	1.41195	.....
1932†	0.26106	$15\frac{1}{8}+$‡	0.32608	$12\frac{1}{2}+$‡	1.07538	$\frac{3}{4}+$	1.35323	$3\frac{1}{8}+$
1932	0.53324	.....	0.68421	.....	1.20693	.....	1.54864	.....
1933	1.06348	.....	1.33526	.....	1.42773	.....	1.79259	.....
1934	0.87756	.....	1.07398	.....	1.65576	.....	2.02636	.....
1935	1.10821	$\frac{3}{4}+$	1.32844	$2\frac{1}{4}-$	1.72205	$4\frac{1}{4}+$	2.06426	$5\frac{3}{4}-$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

The number of individual stock investments used in Test No. 12 is twenty-four; in Test No. 9 it is twenty-three. The results, however, of the two tests, as far as stocks are concerned, differ greatly. Test No. 12 shows unadjusted and adjusted stock yields at the end of 1935 of $7\frac{1}{2}+$ per cent and 9+ per cent, respectively, while the corresponding stock yields for Test No. 9 are only $1\frac{1}{8}-$ per cent and $2\frac{1}{2}+$ per cent, respectively. The stock yield at the end of 1935 in Test No. 12 was slightly more than the bond yield, as can be seen from Table 12. This seems somewhat unusual, as

the duration of the test is only thirteen years and the period favors bonds.

Although the aggregate unadjusted and adjusted yields of the sixteen individual public utility–stock investments used in Test No. 13 turned out very satisfactorily, namely, 5− per cent and $6\frac{3}{8}$+ per cent, respectively, at the end of 1935, the yield was not

TABLE 12

INDEXES AND YIELDS OF INDUSTRIAL STOCKS AND BONDS USED IN TEST NO. 12

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922....	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923....	0.94028	.....	0.92019	.....	1.03861	.....	1.01642	.....
1924....	1.22186	.....	1.20061	.....	1.12568	.....	1.10610	.....
1925....	1.49773	.....	1.42701	.....	1.24823	.....	1.18929	.....
1926....	1.49169	.....	1.43987	.....	1.34098	.....	1.29439	.....
1927....	2.24626	.....	2.21361	.....	1.43556	.....	1.41469	.....
1928....	2.85821	$19\frac{1}{8}$+	2.82817	$18\frac{7}{8}$+	1.47594	$6\frac{3}{4}$−	1.46043	$6\frac{1}{2}$+
1929....	2.54964	$14\frac{1}{4}$+	2.52138	$14\frac{1}{8}$−	1.48657	$5\frac{7}{8}$−	1.47009	$5\frac{5}{8}$+
1930....	2.03193	.....	2.14321	.....	1.51928	$5\frac{3}{8}$−	1.60248	$6\frac{1}{8}$−
1931....	1.16560	.....	1.35507	.....	1.34713	.....	1.56610	.....
1932†...	0.67233	$4\frac{1}{4}$+‡	0.83979	$1\frac{7}{8}$−‡	1.22758	$2\frac{1}{8}$+	1.53334	$4\frac{5}{8}$−
1932....	1.07186	.....	1.37533	.....	1.43127	.....	1.83649	.....
1933....	1.81318	.....	2.27655	.....	1.68168	.....	2.11144	.....
1934....	1.82376	.....	2.23196	.....	2.10190	.....	2.57236	.....
1935....	2.56474	$7\frac{1}{2}$+	3.07442	9+	2.51186	$7\frac{3}{8}$−	3.01103	$8\frac{7}{8}$−

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

nearly so good as the yield on the four individual public utility–stock investments used in Test No. 10. The public utility bonds in Test No. 13 showed unadjusted and adjusted yields at the end of 1935 of $7\frac{1}{4}$− per cent and $8\frac{3}{4}$− per cent, respectively. This is somewhat more than the yield on the stocks in Test No. 13, as shown above, and somewhat less than the yield on the public utility bonds in Test No. 10.

TESTS NO. 11, 12, AND 13 COMBINED

By combining the ninety-two individual stock investments of Tests No. 11, 12, and 13 into a single stock average and the bonds of the same companies into a single bond average, the unadjusted and adjusted yields on the stocks at the end of 1935 were $3\frac{3}{4}+$ per cent and $5\frac{5}{8}-$ per cent, respectively, and on the bonds, $5\frac{3}{4}-$ per cent and $7\frac{1}{4}-$ per cent, respectively.

TABLE 13

INDEXES AND YIELDS OF PUBLIC UTILITY STOCKS AND BONDS USED IN TEST NO. 13

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922....	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923....	0.97843	.....	0.95753	.....	1.05237	.....	1.02989	.....
1924....	1.44310	.....	1.41800	.....	1.18631	.....	1.16568	.....
1925....	1.76951	.....	1.68595	.....	1.27692	.....	1.21662	.....
1926....	2.04921	.....	1.97802	.....	1.39081	.....	1.34249	.....
1927....	2.50210	.....	2.46573	.....	1.48808	.....	1.46645	.....
1928....	3.27460	$21\frac{7}{8}-$	3.24019	$21\frac{5}{8}+$	1.54706	$7\frac{1}{2}+$	1.53080	$7\frac{3}{8}-$
1929....	3.36635	$18\frac{7}{8}+$	3.32903	$18\frac{3}{4}-$	1.56472	$6\frac{5}{8}+$	1.54737	$6\frac{3}{8}+$
1930....	2.75755	.....	2.90856	.....	1.68017	$6\frac{3}{4}-$	1.77218	$7\frac{3}{8}+$
1931....	1.73473	.....	2.01671	.....	1.53049	.....	1.77927	.....
1932†...	0.95765	$\frac{1}{2}-$†	1.19618	$1\frac{7}{8}+$	1.48625	$4\frac{1}{4}+$	1.85644	$6\frac{3}{4}-$
1932....	1.47064	.....	1.88701	.....	1.66780	.....	2.13999	.....
1933....	1.38284	.....	1.73623	.....	1.78312	.....	2.23881	.....
1934....	1.16101	.....	1.42087	.....	2.15885	.....	2.64206	.....
1935....	1.87418	5−	2.24663	$6\frac{3}{8}+$	2.47196	$7\frac{1}{4}-$	2.96320	$8\frac{3}{4}-$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

TESTS NO. 14, 15, AND 16 (PERIOD: 1923–35)

Tests No. 8, 9, 10 combined with Tests No. 11, 12, and 13, respectively.—Tests No. 14, 15, and 16 are Tests No. 8, 9, and 10 combined with Tests No. 11, 12, and 13, respectively. Test No. 14, therefore, used sixty-one individual railroad-stock and railroad-bond investments; Test No. 15, forty-seven individual industrial-stock and industrial-bond investments; and Test No. 16, twenty

individual public utility–stock and public utility–bond investments. The reason for making Tests No. 14, 15, and 16 was to discover the effect upon the security indexes of increasing the number of individual investments in the averages.

Test No. 14 shows average unadjusted and adjusted yields at the end of 1935 on the sixty-one individual railroad-stock invest-

TABLE 14

INDEXES AND YIELDS OF RAILROAD STOCKS AND BONDS USED IN TEST NO. 14

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922....	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923....	1.00537	.....	0.98389	.....	1.03063	.....	1.00861	.....
1924....	1.61584	.....	1.58774	.....	1.13686	.....	1.11709	.....
1925....	2.17841	.....	2.07555	.....	1.22587	.....	1.16798	.....
1926....	2.26684	.....	2.18809	.....	1.32480	.....	1.27878	.....
1927....	2.97524	.....	2.93199	.....	1.44320	.....	1.42222	.....
1928....	3.33240	$22\frac{1}{4}-$	3.29738	22+	1.44372	$6\frac{1}{4}+$	1.42855	$6\frac{1}{8}-$
1929....	3.12555	$17\frac{5}{8}+$	3.09090	$17\frac{1}{2}-$	1.48102	$5\frac{3}{4}+$	1.46460	$5\frac{7}{8}-$
1930....	1.98329	.....	2.09190	.....	1.50689	$5\frac{1}{4}+$	1.58941	6−
1931....	0.67389	.....	0.78343	.....	1.16767	.....	1.35747	.....
1932†...	0.25144	$15\frac{5}{8}+‡$	0.31407	13−	1.02339	$\frac{1}{4}-$	1.27829	$2\frac{5}{8}-$
1932....	0.50065	.....	0.64239	.....	1.16254	.....	1.49166	.....
1933....	0.98694	.....	1.23916	.....	1.37863	.....	1.73095	.....
1934....	0.80898	.....	0.99005	.....	1.61532	.....	1.97687	.....
1935....	1.03207	$\frac{1}{4}-$	1.23717	$1\frac{5}{8}+$	1.70658	$4\frac{1}{4}-$	2.04572	$5\frac{5}{8}+$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

ments used in this test of $\frac{1}{4}-$ per cent and $1\frac{5}{8}+$ per cent, respectively. Even taking into consideration the fact that the period 1923–35 was unfavorable to stock investments, it still is obvious that on the average the railroad stocks used in this test during this period were an unusually poor investment. The unadjusted and adjusted bond yields for Test No. 14 at the end of 1935 were $4\frac{1}{4}-$ per cent and $5\frac{5}{8}+$ per cent, respectively. Over a period favoring neither stocks nor bonds, this yield might appear very satisfactory. But since the period under consideration favors bonds,

the yield mentioned above appears to be somewhat below what a bond investor might expect to receive.

The aggregate stock yields on the forty-seven individual industrial-stock investments used in Test No. 15 at the end of 1935 were 5− per cent and 6⅜+ per cent. This is somewhat below the corresponding bond yields, 7⅝− per cent and 9⅛− per cent, for

TABLE 15

INDEXES AND YIELDS OF INDUSTRIAL STOCKS AND BONDS USED IN TEST NO. 15

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted*	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923	0.96279	.....	0.94222	.....	1.04498	.....	1.02266	.....
1924	1.09663	.....	1.07756	.....	1.13972	.....	1.11990	.....
1925	1.39153	.....	1.32582	.....	1.25757	.....	1.19819	.....
1926	1.45857	.....	1.40790	.....	1.34725	.....	1.30045	.....
1927	2.04344	.....	2.01374	.....	1.43494	.....	1.41408	.....
1928	2.74964	18¾−	2.72075	18⅛+	1.49573	7 −	1.48001	6¾+
1929	2.15560	11⅝−	2.13170	11⅜+	1.52051	6⅛+	1.50365	6+
1930	1.53404	.....	1.61805	.....	1.54491	5⅝−	1.62951	6¼+
1931	0.84498	.....	0.98233	.....	1.32489	.....	1.54025	.....
1932†	0.48646	7⅞+‡	0.60763	5⅜+‡	1.17364	1¾−	1.46597	4⅛−
1932	0.73856	.....	0.94766	.....	1.43810	.....	1.84526	.....
1933	1.26525	.....	1.58859	.....	1.74066	.....	2.18550	.....
1934	1.22951	.....	1.50471	.....	2.16733	.....	2.65243	.....
1935	1.87316	5−	2.24540	6⅜+	2.58955	7⅝−	3.10416	9⅛−

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1. ‡ Discount.

the same test. When, however, one considers that the period 1923–35 favors bonds, and that according to investment theory there is no guaranty that stocks will excel bonds as investments over a relatively short period of time, it becomes evident that these results are in no way at variance with the theory of the long-time superiority of stocks over bonds.

The twenty individual public utility–stock investments used in Test No. 16 show aggregate unadjusted and adjusted yields at

the end of 1935 of $9\frac{5}{8}+$ per cent and $11\frac{1}{4}-$ per cent, respectively, as compared with yields of $7\frac{3}{8}-$ per cent and $8\frac{7}{8}-$ per cent, respectively, for the bonds. The stocks used in this test, therefore, demonstrated their superiority over the bonds at the end of 1935 in spite of the fact that the period favors bonds.

TABLE 16

INDEXES AND YIELDS OF PUBLIC UTILITY STOCKS AND BONDS USED IN TEST NO. 16

End of Year	Stocks				Bonds			
	Unadjusted		Adjusted*		Unadjusted		Adjusted	
	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)	Index	Yield (Per Cent)
1922	1.00000	.....	1.00000	.....	1.00000	.....	1.00000	.....
1923	1.02451	.....	1.00262	.....	1.05360	.....	1.03109	.....
1924	1.68067	.....	1.65144	.....	1.18212	.....	1.16156	.....
1925	2.35466	.....	2.24347	.....	1.27428	.....	1.21411	.....
1926	2.60597	.....	2.51544	.....	1.38228	.....	1.33426	.....
1927	3.79927	.....	3.74405	.....	1.47858	.....	1.45709	.....
1928	5.00010	$30\frac{3}{4}+$	4.94756	$30\frac{1}{2}+$	1.53736	$7\frac{3}{8}+$	1.52120	$7\frac{1}{4}-$
1929	5.99355	$29\frac{1}{8}+$	5.92711	29−	1.56619	$6\frac{5}{8}-$	1.54883	$6\frac{1}{2}-$
1930	4.58083	.....	4.83169	.....	1.67884	$6\frac{3}{4}-$	1.77078	$7\frac{3}{8}+$
1931	2.85576	.....	3.31996	.....	1.51538	.....	1.76170	.....
1932†	1.53785	$4\frac{5}{8}+$	1.92090	$7\frac{1}{8}-$	1.45049	4−	1.81178	$6\frac{1}{2}-$
1932	2.33213	.....	2.99240	.....	1.65161	.....	2.11921	.....
1933	2.45931	.....	3.08780	.....	1.80177	.....	2.26222	.....
1934	2.06907	.....	2.53218	.....	2.16826	.....	2.65357	.....
1935	3.32164	$9\frac{5}{8}+$	3.98173	$11\frac{1}{4}-$	2.51521	$7\frac{3}{8}-$	3.01504	$8\frac{7}{8}-$

* Adjusted by the *Cost of Living Index of the Bureau of Labor Statistics.* † July 1.

TESTS NO. 14, 15, AND 16 COMBINED

The 128 individual stock investments used in Tests No. 14, 15, and 16 show combined unadjusted and adjusted yields at the end of 1935 of $4\frac{1}{8}+$ per cent and $5\frac{5}{8}-$ per cent, respectively, and the bonds of the same companies show combined yields of $6\frac{1}{8}-$ per cent and $7\frac{5}{8}-$ per cent, respectively.

CHAPTER V

DIFFERENT TYPES OF STOCKS AS LONG-TERM INVESTMENTS

ALL the different stock indexes computed in this study may be found represented graphically upon Charts I–VI as follows: Chart I, the railroad-, industrial-, and public utility–stock indexes of Tests No. 1, 2, and 3; Chart II, the railroad-, industrial-, and public utility–stock indexes of Tests No. 8, 9, and 10; Chart III, the railroad-, industrial-, and public utility–stock indexes of Tests No. 11, 12, and 13; Chart IV, the railroad-, industrial-, and public utility–stock indexes of Tests No. 14, 15, and 16; Chart V, the dividend-paying and non–dividend-paying railroad-stock indexes of Tests No. 4 and 6; and Chart VI, the high-priced and low-priced railroad-stock indexes of Tests No. 5 and 7. The six charts mentioned were all made on semilogarithmic graph paper, and, consequently, equal vertical distances upon the charts represent equal percentage changes.

COMPARATIVE INVESTMENT VALUES OF DIFFERENT TYPES OF STOCKS

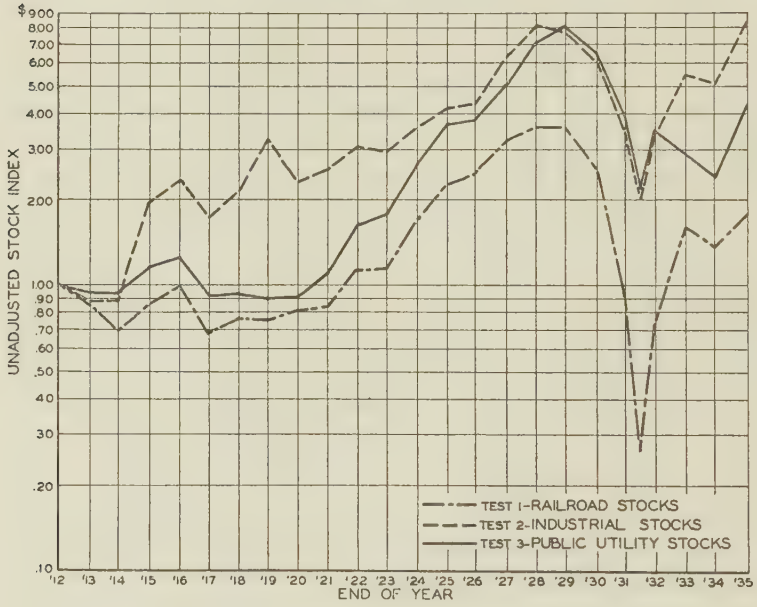
A number of attempts have been made to explain stock prices. For example, Milton Friedman[1] says that there are only two factors that determine stock prices in the long run: anticipated earnings and the interest rate. Friedman says that in the short run additional factors also operate. Among these additional factors he includes such things as manipulation, speculation, the technical position, distress selling, and demand for stock for the purpose of gaining control of a concern. Friedman says further that actual earnings influence stock prices only by influencing the predictions of the traders in the market and that actual earnings account for

[1] "An Empirical Study of the Relationship between Railroad Stock Prices and Railroad Earnings for the Period 1921–1931" (unpublished A.M. diss., department of economics, University of Chicago, 1933).

only a relatively minor portion of the variation in stock prices. John Burr Williams[2] distinguishes between the market value and the investment value of a share of stock. He says that the investment value of a share of stock is the present worth of the future dividends. It can be seen that this definition is identical with Friedman's definition except that Williams substitutes dividends for earnings.

CHART I

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY STOCKS



An attempt will now be made to explain the behavior of the different types of stocks used in the several stock averages of this study. In this explanation considerable emphasis will be placed upon the effect of current earnings on current stock prices. Charts I–IV compare railroad, industrial, and public utility stocks as to investment value. Chart I reveals that the railroad, industrial, and public utility stocks of Tests No. 1, 2, and 3, respectively, were all poor investments from the beginning of 1913

[2] *The Theory of Investment Value* (Cambridge: Harvard University Press, 1938).

to the end of 1914. Since wholesale commodity prices remained practically unchanged during this period, we cannot blame the poor showing made by the stocks at the end of 1914 upon changes in the value of money. But, since the period under discussion was one of declining business activity, a suitable explanation for the poor showing made by the stocks appears to be available in declining business profits.

Chart I also shows that at the end of 1914 the public utility stocks had declined least in value, that the industrial stocks had declined somewhat more than the public utility stocks, and that the railroad stocks had declined most of all. The reason that the public utility stocks decreased less in value than either the railroad or industrial stocks is, no doubt, to be found largely in the fact that the operating revenues of public utilities are more stable than either the operating revenues of railroads or the operating income of industrials. Consequently, during this period of declining industrial production the operating revenues of the public utilities decreased less than the operating revenues of the railroads or the operating income of the industrials. This resulted in larger profits or smaller losses—as the case may be—to the utilities than to the railroads or industrials, and, as a result, the public utility stocks decreased less in value than either the railroad or the industrial stocks.

The reason the railroad stocks declined more in value than the industrial stocks is more difficult to determine. The explanation cannot be found in any advantage that the industrials had over the railroads in the nature of operating income, since the operating income of industrials decreased to a greater extent than the operating revenues of railroads during this period. Perhaps the poor showing made by the railroads can be attributed in part to the extreme difficulty with which they reduce operating expenses during periods of business recession and to their large fixed charges.

Chart I shows further that during the period extending from the beginning of 1915 to the end of 1919 the industrial stocks were a much better investment than either the railroad or the public utility stocks. This was, no doubt, the result, in large part, of the

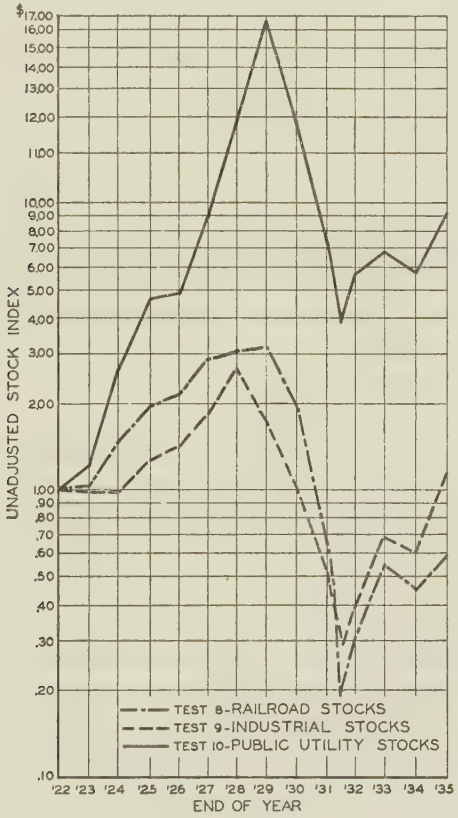
fact that the period under consideration was, in the main, one of rapidly rising commodity prices. Industrial companies tend to show larger profits than either railroad or public utility companies during periods of rapidly rising commodity prices, since during such periods the operating income of industrials tends to increase at a more rapid rate than the operating revenues of railroads and public utilities. This is caused, of course, by the fact that increases in railroad and public utility rates tend to lag behind increases in wholesale commodity prices. During periods of rapidly rising prices net profits of railroads and public utilities may actually decrease, because operating expenses increase more rapidly than operating revenues. During the period under consideration this is what actually happened to American railroads and public utilities.

Although increases in railroad and public utility rates had a tendency to lag behind increases in wholesale commodity prices from 1915 to 1920, rate-making bodies did grant increases in rates to both railroads and public utilities on a number of occasions during this period, and substantial increases in rates were granted to railroads during the latter part of 1920. Then in 1920 began a period of subnormal business activity that was accompanied by substantial reductions in wholesale commodity prices. Business did not return to normal until the latter part of 1922. As Chart I shows, during this period of lowered commodity prices and subnormal business activity the railroad and public utility stocks showed substantial increases in value, while the industrial stocks were worth less at the end of 1922 than at the beginning of 1920. No doubt the principal reason that the railroad and public utility stocks made a better showing than did the industrial stocks during this period is to be found in the tendency for changes in railroad and public utility rates to lag behind changes in wholesale commodity prices. As a result of this lag in rates the operating revenues of railroads and public utilities did not suffer as much as the operating income of industrials. The somewhat poorer showing made by the railroads than by the public utilities, is no doubt, the result of the tendency for the operating revenues of railroads to fluctuate more widely than the operating revenues of public utilities with changes in the volume of industrial production.

Charts I–IV all show that for the period extending from the beginning of 1923 to the end of 1929 railroad and public utility stocks were better investments than industrial stocks. This was a period for the most part of high business activity. Wholesale

CHART II

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY STOCKS



commodity prices varied but little and were only slightly lower at the end of 1929 than at the beginning of 1923. Lagging railroad and public utility rates may also help to explain why the railroad and public utility stocks were better investments than the industrial stocks during this period. It will be noticed that most of the gains made by the railroad and public utility stocks

over the industrial stocks during this period were made from 1923 to 1925. Perhaps these three years of practically unchanging wholesale commodity prices gave railroad and public utility rates a chance to catch up with commodity prices. At any rate, the benefits which railroads and public utilities gained from falling commodity prices following the crisis of 1920 seem to have largely disappeared by the end of 1925. From 1926 to 1929 public utility stocks were only slightly better than industrial stocks as investments, while railroad stocks were poorer than industrial stocks.

Some have said that one reason why stocks of all kinds increased so rapidly in value from 1923 to 1929 was that corporations were able to earn unusually large profits through reduced operating expenses resulting from improved methods of management and operation. The unusual heights to which stock prices rose before the stock-market crash of 1929 cannot, however, be explained entirely in terms of current profits. Nor can they be explained in terms of anticipated future profits. The true explanation lies in irrational human behavior—irrational at least from the viewpoint of the long-term investor. People bought stocks in anticipation of rising stock prices.

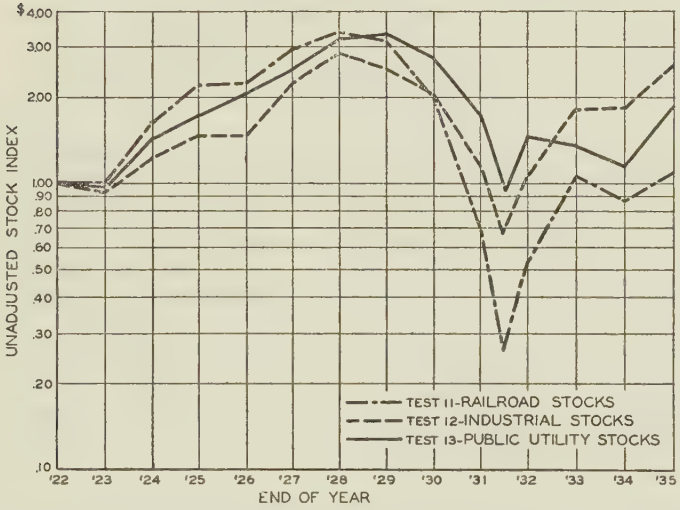
An examination of the four charts mentioned above will show that from the end of 1929 to July 1, 1932, railroad, industrial, and public utility stocks all decreased greatly in value. This was a period of rapidly falling commodity prices accompanied by an unprecedented decline in business activity. All the charts show that during this period railroad stocks declined in value more than either industrial or public utility stocks. At first glance it might appear unusual that railroad stocks declined in value more than industrial stocks. Since this is a period of declining prices, one might suppose that the lag in railroad rates would make railroad stocks a better investment than industrial stocks. No doubt the rapid decrease in commodity prices did cause the operating income of industrials to decline more rapidly than the operating revenues of railroads. But any advantage that the railroads gained over the industrials in operating revenues was more than offset by the fact that railroads were not able to reduce operating expenses as rapidly as were industrials and by the relatively larger

fixed charges of the railroads. Consequently, railroads showed smaller profits or larger losses than industrials, and railroad stocks declined more in value than did industrial stocks.

The principal reason why the public utility stocks decreased less in value than the railroad stocks can, no doubt, be traced to the greater stability of the operating revenues of the utilities.

CHART III

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY STOCKS



This greater stability in operating revenues appears to make public utility stocks not only a better investment than railroad stocks during a period of business recession but also a better investment than industrial stocks, and this in spite of any advantage that industrials might have in the way of operating expenses or fixed charges. However, if a business recession were to occur during a period of rising prices, industrial stocks might be a better investment than public utility stocks, because of the handicap imposed upon the utilities by lagging utility rates.

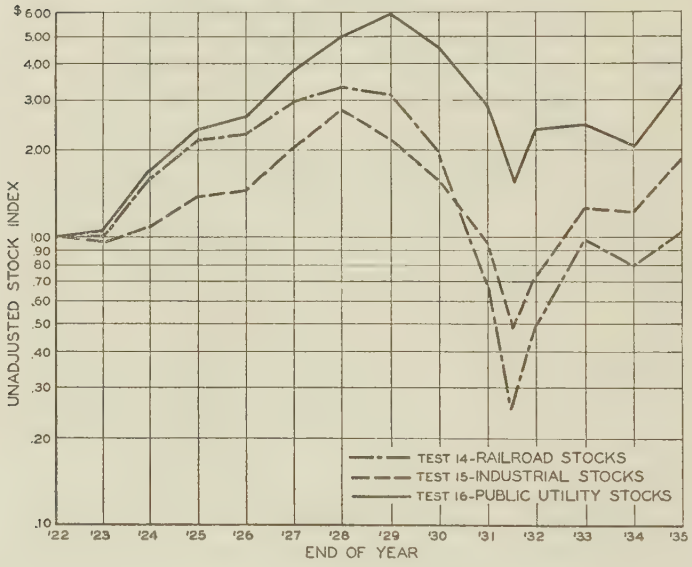
The revival of business following July 1, 1932, brought about rapid recovery in all three types of stocks; but before long it became evident that the recovery of the railroad and public utility

stocks was being retarded by increasing operating expenses growing out of rising prices and by restricted operating revenues resulting from lagging railroad and public utility rates. Perhaps the slow recovery of the public utilities has also been the result, in part, of recent adverse public utility legislation.

Chart I shows that from 1913 to 1933 industrial stocks were a better investment than public utility stocks. Chart III shows

CHART IV

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY STOCKS



that the same was true from 1923 to 1935. On the other hand, Charts II and IV both show public utility stocks to be a better investment than industrial stocks from 1923 to 1935. All four charts show that as a rule industrial stocks were a better investment than public utility stocks during periods of rising commodity prices and that public utility stocks were a better investment than industrial stocks during periods of falling commodity prices. In all four comparisons railroad stocks proved to be a poorer investment than either industrial or public utility stocks.

The unusually poor showing made by railroad stocks in the present study is probably the result of a number of causes. First, the Interstate Commerce Commission has, in the main, been reluctant to grant to railroads rates which would permit them to make substantial earnings on their common stock. Second, during the period covered by this study, railroads had been meeting ever increasing competition, chiefly in the form of motor vehicles. And, third, the fact that the railroad industry has passed the peak of its period of growth and expansion may have something to do with the apparently declining earnings of the railroads.

Generalizations about public utilities contain less truth than generalizations in regard to railroads, since public utilities are made up not of one but of a number of different industries. However, it appears, speaking generally and disregarding street railways, that the better showing made by public utility stocks than by railroad stocks in the present study was the result, in part at least, of the following: First, public utility commissions have been more liberal than has the Interstate Commerce Commission in the matter of granting rates. Second, public utilities have been subject to less competition than have railroads. And, third, public utilities experienced a period of rapid growth and expansion from 1913 to 1935, while the peak of railroad expansion was reached some time prior to the period covered by the present study.

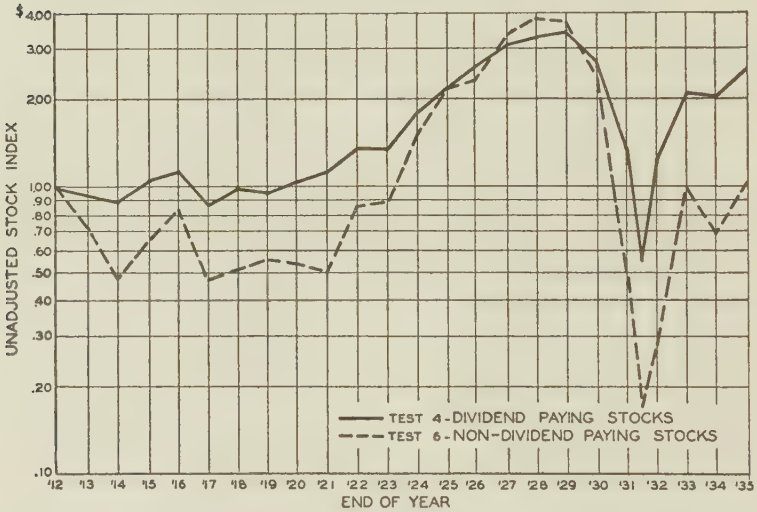
It is even more difficult to explain the behavior of a group of industrial stocks than it is to explain the behavior of a group of public utility stocks, because an even greater variety of activities is performed by industrials than by public utilities. However, the good showing made by the industrial stocks used in this study was, no doubt, the result in large part of the unusually high industrial activity which prevailed during a considerable portion of the time covered by the tests.

Charts V and VI show that the non-dividend-paying and low-priced railroad stocks (speculative railroad stocks) behaved much the same as the dividend-paying and high-priced railroad stocks (high-grade railroad stocks). That is, fluctuations in value usually occurred at about the same time and in the same direction in both

the speculative and the high-grade stocks. These fluctuations were, however, greater for the speculative than for the high-grade stocks. Although the charts would seem to indicate that over a sufficiently long period of time high-grade railroad stocks are in the aggregate a better investment than speculative railroad stocks, over relatively short periods of time the charts show that speculative railroad stocks may be, or at least have been, better

CHART V

COMPARATIVE INVESTMENT VALUES OF STOCKS OF DIVIDEND-PAYING AND NON-DIVIDEND-PAYING RAILROAD COMPANIES



investments than high-grade railroad stocks. And even if it could be proved that high-grade railroad stocks are in the aggregate a better long-term investment than speculative railroad stocks, this does not prove that high-grade stocks are in general and in the aggregate a better investment than speculative stocks.

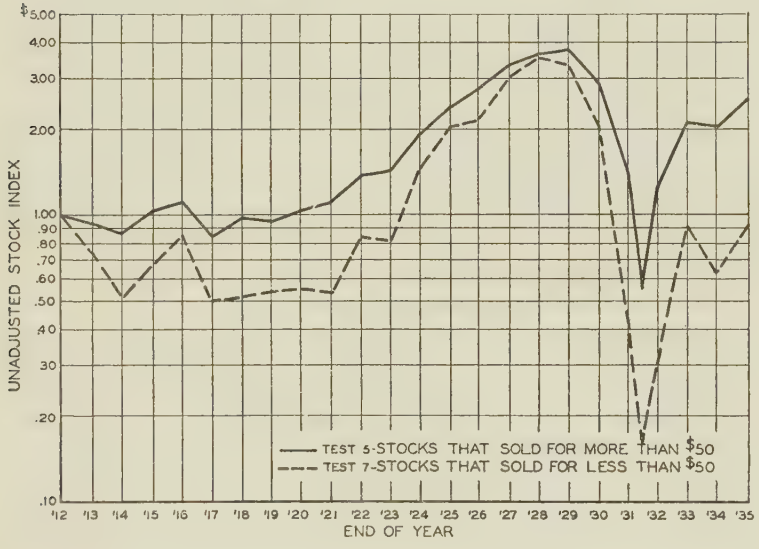
THE EFFECT OF THE NUMBER OF SECURITIES ON INVESTMENT AVERAGES

One aspect of investment study which apparently has not received as much attention as its importance warrants is the effect of the number of securities used in the investment averages. It

has frequently been assumed that all that is necessary to find out the investment value of a certain type of security over a number of years is to construct an average using the securities of a very small number of companies, often ten. Little attention has been given to the wide variation in investment value which often exists among different securities of the same general type or to the effect that chance might play in the selection of a small number

CHART VI

COMPARATIVE INVESTMENT VALUES OF RAILROAD STOCKS THAT SOLD FOR MORE THAN AND LESS THAN $50 A SHARE



of securities. The point just mentioned can be illustrated by examining a number of the tests made in this study.

In Test No. 1, fifty-two individual stock investments were used in the stock average. One of these fifty-two individual stock investments alone produced 22.4+ per cent of the total investment value of the stocks at the end of the test; four of the fifty-two individual stock investments produced 53.4+ per cent; and twenty-six, or 50 per cent, of the individual stock investments produced 95.8+ per cent of the total value. From these facts it can be seen that it would be possible for a person to select arbitrarily or at

random ten individual stock investments from the fifty-two and have an investment which might be unusually good or unusually poor. Test No. 2 emphasizes even more than does Test No. 1 the unreliability of stock averages based upon an inadequate number of stocks. There were twenty-four individual stock investments in the stock average of this test. One of these twenty-four individual stock investments produced 41.1 − per cent of the total final investment value of the test; two of the individual stock investments produced 52.7 − per cent of the total value; and twelve, or 50 per cent, of the individual stock investments produced 97.4 − per cent of the total value. Test No. 3, although it does not show the need for diversification as clearly as either Test No. 1 or Test No. 2, nevertheless illustrates this need. One of the sixteen individual stock investments of this test produced 37.6+ per cent of the total value at the end of the test; two of the individual stock investments produced 49.1+ per cent; and eight, or 50 per cent, of the individual stock investments, 91.6− per cent of the final value.

CHAPTER VI

DIFFERENT TYPES OF BONDS AS LONG-TERM INVESTMENTS

THE bond indexes of the several tests are presented graphically on Charts VII–XII. Chart VII shows the bond indexes of Tests No. 1, 2, and 3; Chart VIII, the bond indexes of Tests No. 8, 9, and 10; Chart IX, the bond indexes of Tests No. 11, 12, and 13; Chart X, the bond indexes of Tests No. 14, 15, and 16; Chart XI, the bond indexes of Tests No. 4 and 6; and Chart XII, the bond indexes of Tests No. 5 and 7. The bond charts, like the stock charts, were also made on semilogarithmic paper, and, as a result, equal vertical distances on the chart show equal changes in per cent.

THE COMPARATIVE INVESTMENT VALUES OF DIFFERENT TYPES OF BONDS

In attempting to show why the different types of bonds used in the several tests were not equally good as investments, consideration was given to four things: first, the average rate of yield at which the bonds were purchased; second, the average rate of current-income yield at which the bonds were purchased; third, losses from defaults in interest; and fourth, appreciation and depreciation of bond principal. Charts VII–X each compare railroad, industrial, and public utility bonds as to investment value. The first bonds used in the different bond averages represented on these charts were purchased to yield the average rates of return shown in Table 17.

As Table 17 shows, in each of the four comparisons the industrial and public utility bonds were purchased on a higher yield basis and on a higher current-income basis than the railroad bonds. In three of the four comparisons the industrial bonds were purchased on higher yield bases and on higher current-income bases than the public utility bonds. In all four comparisons the

amount of interest actually received from bond coupons was relatively greater for the industrial and public utility bonds than for the railroad bonds for the following reasons: First, the industrial and public utility bonds were purchased on higher current-income bases than the railroad bonds; and, second, the railroad bonds lost relatively more through defaults in interest than the industrial or public utility bonds.

Appreciation or depreciation of bond principal—in other words, an increase or decrease in the market price of a bond—may result

TABLE 17

YIELD AND CURRENT INCOME OF BONDS USED IN TESTS NO. 1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, AS SHOWN IN CHARTS 7–10

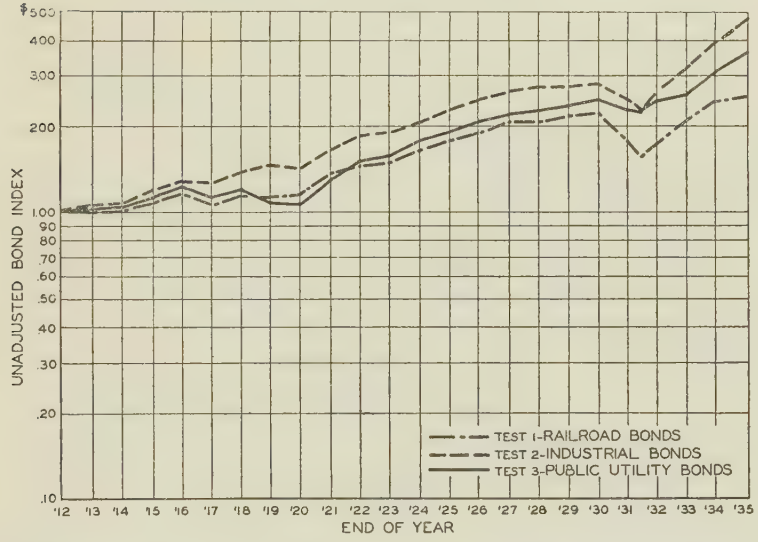
CHARTS	RAILROAD BONDS		INDUSTRIAL BONDS		PUBLIC UTILITY BONDS	
	Yield (Per Cent)	Current Income (Per Cent)	Yield (Per Cent)	Current Income (Per Cent)	Yield (Per Cent)	Current Income (Per Cent)
7.....	4.49	4.52	6.50	6.24	5.27	5.14
8.....	5.65	5.55	7.07	7.06	5.78	6.64
9.....	5.56	5.25	6.00	5.60	6.21	5.66
10.....	5.57	5.29	6.51	6.31	6.12	5.65

from any one of three different causes: First, the increase or decrease may be simply the normal amortization of bond discount or premium as the bond approaches maturity. Such an increase or decrease in price would not affect the yield on the bond. Second, changes in the market price of a bond may result from changes in the pure interest rate. The market price of a riskless bond fluctuates inversely with changes in the pure interest rate. The pure interest rate frequently fluctuates inversely with changes in commodity prices and with changes in industrial production. Third, changes in the market price of a bond may result from changes in the degree of risk assumed by the owner of the bond. The market price of a bond tends to decrease as risk increases and to increase as risk decreases. However, the effect of changes in risk upon the price of a bond may be more or less neutralized by

changes in the pure interest rate. To illustrate: The risk assumed in owning an industrial bond usually decreases during a period of rising commodity prices and increasing business activity, and this decrease in risk tends to force the price of the bond upward; but, if at the same time the pure interest rate is increasing, this tends to force the price of the bond downward. Whether the bond actually increases or decreases in price depends upon which of these

CHART VII

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY BONDS



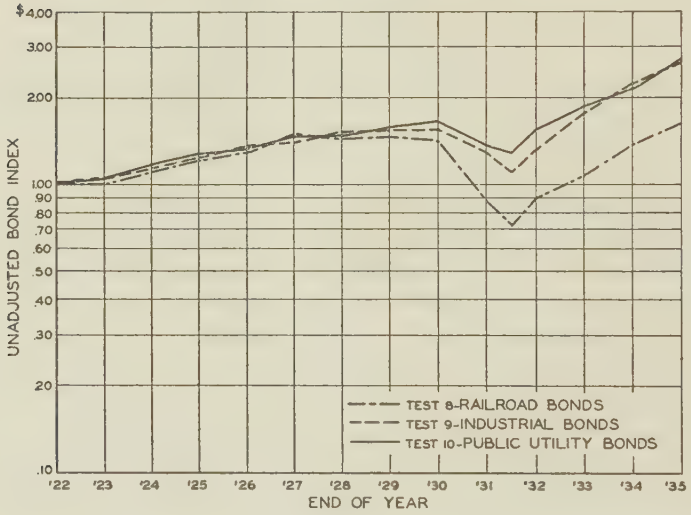
forces is the stronger. On other occasions, both risk and the pure interest rate might co-operate to force the price of a bond upward or downward.

As Chart VII shows, the industrial bonds used in this comparison were a better investment than either the railroad or the public utility bonds during the period from the beginning of 1913 to the end of 1919. Two reasons why the industrial bonds were superior to the railroad and public utility bonds during this period are: first, the industrial bonds received relatively more interest income on the original investment than either the railroad or the

public utility bonds; and, second, the industrial bonds lost relatively less from depreciation of bond principal than did the railroad or public utility bonds. The initial average current-income yield as shown in Table 17 was higher for industrial bonds than for either railroad or public utility bonds; and, since there were practically no defaults in interest on industrial bonds from 1913 to 1919, it is obvious that industrial bonds received a higher rate

CHART VIII

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY BONDS



of interest income on the original investment than either railroad or public utility bonds.

The reason why the industrial bonds lost relatively less from depreciation of bond principal than did railroad or public utility bonds between 1913 and 1919 is to be found in a difference in risk. It will be recalled that industrial companies were, in the main, very prosperous from 1915 to 1919 and that the stocks of those companies increased greatly in value during that period. If this boom in industrial-stock prices had not been accompanied by a large increase in the pure interest rate, one might have expected a substantial increase in industrial-bond prices during those years;

but, because of the depressing effect of a rising pure interest rate, industrial-bond prices on the average declined slightly. On the other hand, since the railroad and public utility bonds were depressed by both a rising pure interest rate and a decline in railroad and public utility earnings, they declined considerably in value between 1913 and 1919.

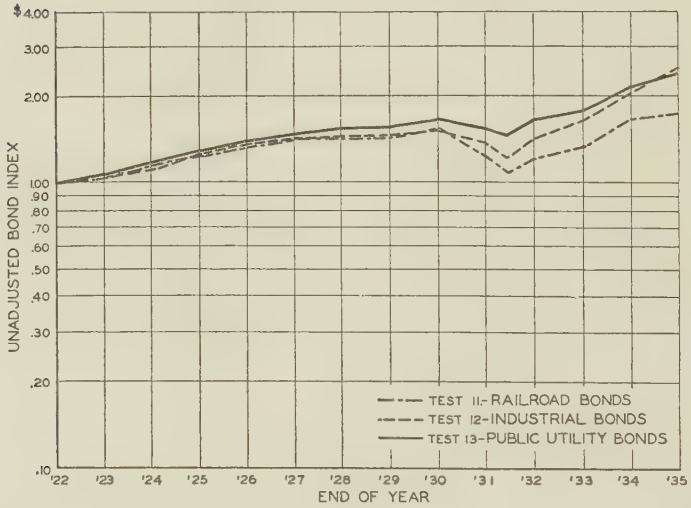
Chart VII shows further that from the end of 1919 to the beginning of 1923 both the railroad and the public utility bonds were better investments than the industrial bonds. Since the interest income was relatively greater on the industrial bonds than on the railroad and public utility bonds during this period of time, the better showing made by the railroad and public utility bonds can be due to only one thing, and that is greater appreciation in principal. It will be recalled that between 1919 and 1923 both railroad and public utility companies were more prosperous than industrial companies, hence the risk element favored railroad and public utility bonds over industrial bonds during this period of time. Chart VII also shows that the public utility bonds were a better investment than the railroad bonds between 1919 and 1923. The reasons for this are: first, the interest income was relatively greater on the public utility bonds than on the railroad bonds; and, second, public utility companies enjoyed greater prosperity than railroad companies.

The behavior of the different types of bonds shown in Charts VII, VIII, IX, and X, between 1922 and 1930, can be explained largely in terms of interest income and changes in the element of risk. In all four of these comparisons the initial industrial and public utility bonds were purchased both on higher yield bases and on higher current-income bases than the railroad bonds. Since the initial industrial and public utility bonds were purchased on higher current-income bases than the railroad bonds and since in all cases losses of interest through defaults were less for industrial and public utility bonds than for railroad bonds, it naturally follows that in each of the comparisons both industrial and public utility bonds had an advantage over railroad bonds in the relative amount of interest received on the original investment. On the other hand, in all four comparisons for at least the earlier portion

of the period extending from the beginning of 1924 to the end of 1930, railroad and public utility bonds had an advantage over industrial bonds in the matter of gains from appreciation of bond principal. The public utility and railroad bonds gained more through appreciation than industrial bonds for a number of years following 1923, because during this period railroad and public utility companies were more successful than industrial companies.

CHART IX

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY BONDS



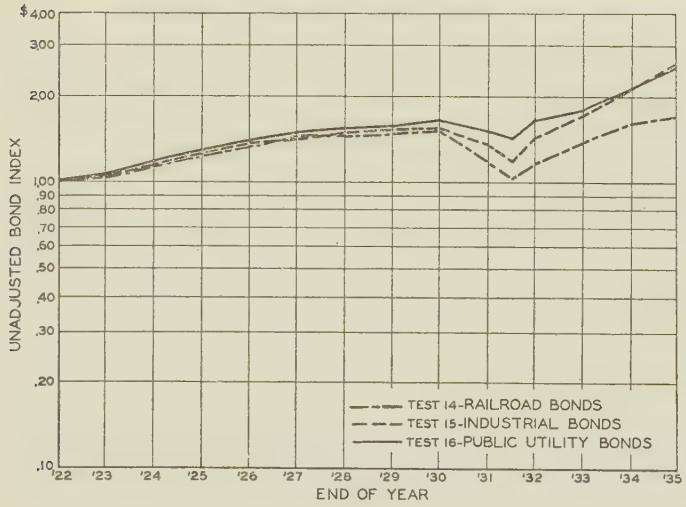
Charts VII–X all show that between 1923 and 1930 public utility bonds were better investments than either railroad or industrial bonds. Public utility bonds were better investments than railroad bonds during this period of time for two reasons: the interest income was relatively higher on the public utility bonds than on the railroad bonds; and, second, the public utility bonds gained more than the railroad bonds through appreciation. The public utility bonds were better investments than the industrial bonds largely because they gained more through appreciation than the industrial bonds. In three out of the four comparisons the industrial bonds had a higher interest income than the public

utility bonds. The railroad bonds and the industrial bonds were about equal as investments between 1913 and 1930. The advantage that the industrial bonds had in interest income was almost completely offset by the greater appreciation on the railroad bonds.

Charts VII, VIII, IX, and X all show that from the beginning of 1931 to July 1, 1932, industrial bonds decreased in value more

CHART X

COMPARATIVE INVESTMENT VALUES OF RAILROAD, INDUSTRIAL AND PUBLIC UTILITY BONDS



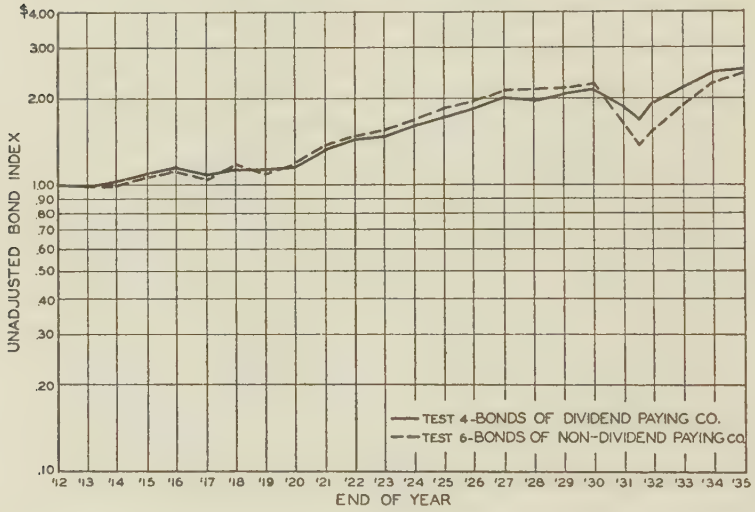
than public utility bonds and that railroad bonds decreased in value more than industrial bonds. The principal reason for this was that during the recent business depression industrial companies suffered more than public utility companies and railroad companies suffered more than industrial companies. The reason that the railroad and public utility bonds shown in these four comparisons have not recovered as much since the depression as the industrial bonds is that railroad and public utility companies have not recovered as much as industrial companies.

Chart XI compares bonds of dividend-paying railroad companies with bonds of non-dividend-paying railroad companies,

and Chart XII compares bonds of railroad companies whose stocks sold for more than $50 a share at the beginning of 1913 with bonds of railroad companies whose stocks sold for less than $50 a share at the beginning of 1913. For convenience the bonds of dividend-paying companies and companies whose stocks sold for more than $50 a share will be referred to as high-grade bonds, while the bonds of non–dividend-paying companies and companies

CHART XI

COMPARATIVE INVESTMENT VALUES OF BONDS OF DIVIDEND-PAYING AND NON–DIVIDEND-PAYING RAILROAD COMPANIES



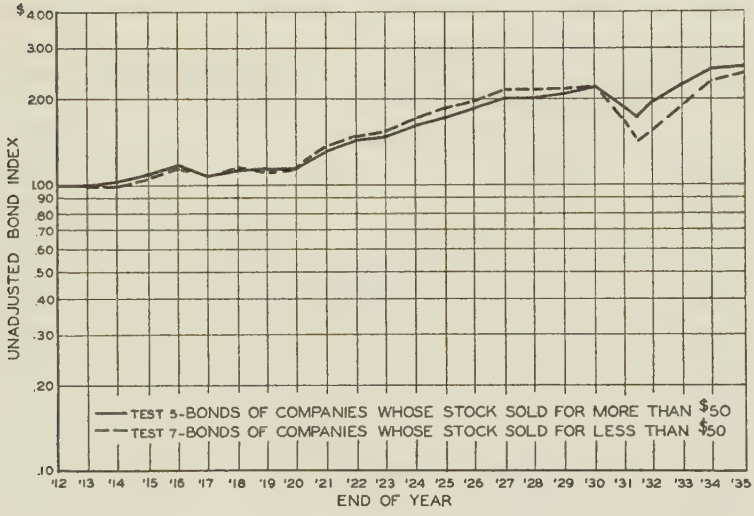
whose stocks sold for less than $50 a share will be referred to as speculative bonds.

As Charts XI and XII show, from the beginning of 1913 to the end of 1921 the speculative and high-grade railroad bonds were about equal as investments. During this period the income actually received on the speculative bonds was about ½ per cent greater than that received on the high-grade bonds. The reasons for this are as follows: First, the speculative bonds were purchased on current-income bases about ½ per cent higher than the high-grade bonds; and, second, there were practically no defaults in interest from 1913 to 1921 either on the high-grade or on the speculative

bonds. The reason that the speculative bonds were not better investments than the high-grade bonds from 1913 to 1921 was that they depreciated more in value during this period than the high-grade bonds. It will be recalled that during this period railroad companies were anything but successful, and one would naturally expect speculative bonds to depreciate more in value than high-grade bonds during such a period.

CHART XII

COMPARATIVE INVESTMENT VALUES OF BONDS OF RAILROAD COMPANIES WHOSE STOCKS SOLD FOR MORE THAN AND LESS THAN $50 A SHARE



From the beginning of 1922 to the end of 1930 the speculative bonds were better investments than the high-grade bonds. The superiority of the speculative bonds was caused, however, only in small part by a greater interest income on the speculative bonds. Numerous defaults in interest on the speculative bonds during this period reduced the rate of interest actually received on these bonds to little more than that received on the high-grade bonds. The real reason why the speculative bonds were better investments from 1922 to 1930 than the high-grade bonds was that railroad companies were unusually successful during a considerable

portion of this period, and, consequently, the speculative bonds appreciated in value more than the high-grade bonds.

From the beginning of 1931 to July 1, 1932, the speculative bonds decreased in value more than the high-grade bonds, and from July 1, 1932, to the end of 1935 the speculative bonds increased in value more than the high-grade bonds. This, of course, was to be expected, since speculative bonds show wider fluctuations in value than high-grade bonds. The yields on the speculative bonds for the whole period from the beginning of 1913 to the end of 1935 were only slightly less than the yields on the high-grade bonds, in spite of the fact that the period covered appears to favor high-grade bonds over speculative bonds.

THE EFFECT OF THE NUMBER OF SECURITIES ON INVESTMENT AVERAGES

As long as the securities of the same companies are under consideration, diversification is of more importance in stock investments than in bond investments. The reason for this is that stocks show much greater variation in investment value than bonds. To illustrate: The 16 tests of the present study made use of 128 individual stock investments and 128 individual bond investments. The total yield on the stock investments was greater than the total yield on the bond investments, yet in only 30 out of the 128 cases were stocks better investments than bonds issued by the same companies, while in 98 out of the 128 cases bonds were better investments than stocks. As everyone knows, however, many bonds are more speculative than many stocks, and, if highly speculative bonds are to be used in a test, in order to get results which in any way show the true investment value of these securities in the aggregate, it is necessary to include a considerable number of bonds in the bond average. A number of individual bond investments used in the present study became practically worthless, while one individual bond investment used in Test No. 2 produced 16.6 per cent of the total final value of the bonds used in that test, although it was only one of 24 individual bond investments.

CHAPTER VII

CONCLUSION

THE COMMON STOCK THEORY

IT IS not the intention of this study to suggest that the Common Stock Theory is invalid, that is, at least to suggest that the theory has not been valid in the past; but when one examines the investment studies that have attempted to establish this theory, it becomes evident that the theory has been accepted without actually being proved. In the first place, the proof of the Common Stock Theory depends upon establishing what happens to securities during periods which favor bonds or during periods which favor neither stocks nor bonds. The Common Stock Theory cannot be proved by showing that stocks are better investments than bonds during periods that favor stocks. This is obvious, of course, but apparently it has been almost overlooked or disregarded by some of the advocates of the Common Stock Theory. In the second place, the Common Stock Theory calls for high-grade stocks. The methods used for selecting stocks in most of the investment studies by no means insure the stocks to be high grade. As a matter of fact, the writer has failed to find a single common-stock theorist who has made a serious attempt to explain just what a high-grade stock is. And, in the third place, a large percentage of the investment tests which have attempted to establish the Common Stock Theory have included only ten stocks in the stock averages. Certainly ten stocks are too few to give dependable results.

By 1929 the Common Stock Theory had been generally accepted as true, but it had by no means been proved. As far as we have been able to learn, there have been only two attempts prior to the crisis of 1929 to determine the comparative value of common stocks and bonds during long-term periods in which the general trend of commodity prices was downward or during long-

term periods in which prices first fell and then rose to about previous levels. These attempts were made by Smith and Van Strum; but, as previously pointed out, because of the small number of securities used and the use of inappropriate securities in certain cases, the results obtained by both Smith and Van Strum are of very doubtful value.

Since the crisis of 1929 a number of investment studies have been made that cover periods of time that do not favor stocks. Gilbert Harold, J. L. Amberg, and D. M. Clayton each made three tests. Harold's tests terminated in 1932, and Amberg's and Clayton's tests terminated in 1931. In each of these nine tests the number of stocks in the stock average was ten. Although each of these tests shows common stocks to be a better investment than bonds, they come no nearer establishing the Common Stock Theory than do the tests made by Smith and Van Strum. The number of stocks used was too small to be conclusive, and the stocks were not necessarily high grade.

Even the elaborate study made by Rose, which ends with the beginning of 1933, does not prove the Common Stock Theory, as many of the stocks used in the tests were, no doubt, of a more or less speculative nature. Nor does the study made by the Cowles Commission, which covers the period from 1871 to 1937 and is perhaps the most inclusive of all investment studies, prove the Common Stock Theory. It does prove, however, that in the aggregate the common stocks listed on the New York Stock Exchange between 1871 and 1937 have been a better investment than high-grade bonds.

Four tests of the present study—Tests No. 4, 5, 2, and 3—may be of some value as a check upon the validity of the Common Stock Theory. All these tests cover the period from the beginning of 1913 to the end of 1935. Tests No. 4 and 5 each make use of the stocks and bonds of most of the high-grade American railroads. In each of these tests the yield on the stocks was about equal to the yield on the bonds. But since the period under consideration seems to favor bonds, it would appear that high-grade railroad stocks have been a somewhat better long-term investment than high-grade railroad bonds since 1913. Because of this

fact some might contend that the Common Stock Theory has held true for railroad stocks since 1913. It is the opinion of the writer, however, that such a conclusion is not warranted. The Common Stock Theory is a general theory, not a specific theory; and the yield on high-grade railroad stocks since 1913 has been less than the combined yield on the railroad, industrial, and public utility bonds of Tests No. 4, 5, 2, and 3.

Test No. 2, which uses twenty-four individual industrial-stock investments and twenty-four individual industrial-bond investments, also covers the period from 1913 to 1935. This test shows stocks to be a better investment than bonds. The stocks of Test No. 2 were also a better investment from 1913 to 1935 than the combined railroad, industrial, and public utility bonds of Tests No. 4, 5, 2, and 3. The stocks, therefore, were a better investment than bonds during a period that appears to favor bonds. But the value of this test as a check on the Common Stock Theory is limited. In the first place, the stocks used make up only a small fraction of the industrial stocks of the country, and, in the second place, some of the stocks used in this test were not high grade.

Test No. 3, which makes use of only sixteen individual public utility–stock investments and sixteen individual public utility–bond investments, like the other tests mentioned, covers the period from the beginning of 1913 to the end of 1935. This test shows stocks to be a better investment than bonds. The stocks of Test No. 3 were also a better investment during the period from 1913 to 1935 than the combined railroad, industrial, and public utility bonds of Tests No. 4, 5, 2, and 3. Test No. 3 presents the same difficulties apparent in Test No. 2, that is, the number of stocks used in the average is too small to make results reliable, and some of the stocks were not high grade.

It should be recalled, however, that the Common Stock Theory is a general theory, not a specific theory. That is, the theory does not say that over a long term of years high-grade railroad stocks are a better investment than high-grade bonds, or that high-grade industrial or public utility stocks are better investments than high-grade bonds. The theory says that over a long period of time a diversified portfolio of high-grade stocks selected from essential

industries is a better investment than high-grade bonds. It therefore follows that the fact that high-grade railroad stocks appear to have been a poorer investment than bonds from 1913 to 1935 by no means disproves the Common Stock Theory.

All the individual railroad-, industrial-, and public utility–stock investments used in Tests No. 4, 5, 2, and 3 were combined into a single stock average, and all the individual bond investments used in the same tests were combined into a single bond average in an attempt to see whether or not the Common Stock Theory held true from the beginning of 1913 to the end of 1935. Since the stocks and bonds of most of the high-grade railroad companies of the United States are included in Tests No. 4 and 5, it would seem that railroads were adequately represented in the combined stock and bond averages. However, because of the small numbers of industrial and public utility stocks used in Tests No. 2 and 3 and because of the fact that some of these stocks were not high grade, it would appear that neither industrial nor public utility stocks were adequately represented in the combined stock average. The case is, no doubt, different with industrial and public utility bonds. Because bonds fluctuate much less in value than stocks, it would seem that there were sufficiently large numbers of bonds in Tests No. 2 and 3 to represent fairly well the long-term investment value of industrial and public utility bonds. The fact that some of these bonds were more or less speculative did not reduce the bond yields. The yields on the bonds were at least as high and perhaps higher than they would have been if all of them had been high grade.

The combined averages show that from 1913 to 1935 stocks were a better investment than bonds. Some might contend that this comparison is not fair to bonds, since wholesale commodity prices were some 15 per cent higher at the end of 1935 than at the beginning of 1913. In order to remove any doubt to as whether or not the combined stocks of Tests No. 4, 5, 2, and 3 have been a better long-term investment than the combined bonds of the same tests, we might assume that the tests ended at the end of 1933. If these tests had ended at the end of 1933, the combined stock average would still have been a better investment than the combined

bond average; and this in spite of the fact that the period extending from 1913 to 1933 unquestionably favors bonds. The wholesale commodity price level was practically the same at the end of 1933 as at the beginning of 1913, but the volume of industrial production was only about 50 per cent as great at the end of 1933, relative to normal, as at the beginning of 1913. The results of this combined test, in spite of the fact that neither industrial nor public utility stocks were adequately represented in the stock average, at least seem to suggest the probability that the Common Stock Theory held true from the beginning of 1913 to the end of 1935.

THE EFFECT OF THE NUMBER OF SECURITIES ON INVESTMENT AVERAGES

Most investment tests have used a very small number of stocks in the stock averages, ten being the number most frequently used. The present study indicates that stock averages based upon small numbers of stocks are of little value. Although diversification does not appear to be as necessary for bonds as for stocks, yet in case the bonds used are speculative, bond averages to be dependable should contain a fairly large number of bonds.

COMPARATIVE INVESTMENT VALUES OF DIFFERENT TYPES OF STOCKS

Smith, Van Strum, Pearson, Shore, Rodkey, the Cowles Commission, and the present study all found industrial stocks better long-term investments than railroad stocks. Although investment tests have in practically all cases found industrial stocks to be better long-term investments than railroad stocks, yet it has by no means been established that industrial stocks in general are better long-term investments than railroad stocks. It should be recalled that the small number of industrial stocks that have been used in tests are, in the main, a highly selective group of securities, and that there are thousands of industrial stocks, many of which are more or less worthless, that have not as yet found their way into stock averages. Perhaps if an investment average could be constructed which included the stocks of all the industrial companies in the United States, it might show that industrial stocks

are as a class in no way superior to railroad stocks. But, since such an investment average has not been constructed, any predictions as to what the results of such an average might show are purely conjectural.

Jackson, Shore, and the Cowles Commission all found industrial stocks better investments than public utility stocks. The present study found industrial stocks better investments during periods of rising prices and public utility stocks better investments during periods of falling prices.

As to which have been better long-term investments in the past, industrial stocks or public utility stocks, nothing can be said with certainty. The stock averages of the different investment studies have contained too few stocks to be conclusive. Still further, these securities have not been truly representative of industrial or public utility stocks in general. The industrial and public utility stocks so far studied, however, show, in the main, that both types of securities have been good long-term investments with little to choose between them. They have both been better long-term investments than either high-grade or speculative railroad stocks

There is some difference of opinion as to whether high-grade or speculative securities are better investments. Pearson's tests indicated that high-grade railroad stocks are better investments than speculative railroad stocks, while Smith found speculative rails better than conservative rails. Tests made by Pearson and Stugard showed high-grade industrial stocks to be better investments than speculative industrial stocks, while Van Strum found speculative industrial stocks better investments than high-grade industrial stocks. The fact that only ten stocks were used in most of these tests no doubt accounts for the differences in results. It might be added here that Tests No. 4, 5, 6, and 7 of the present study show that speculative railroad stocks were a better investment than high-grade railroad stocks during a period in which railroad companies were unusually successful and that high-grade railroad stocks were a better investment than speculative railroad stocks during two different periods in which railroad companies were unusually unsuccessful.

Both of Jackson's investment studies show common stocks to

be superior to preferred stocks as long-term investments. Rodkey's study also shows common stocks better long-term investments than preferred stocks. Woodworth's investment tests show common stocks better than preferred stocks in thirty-one out of thirty-four industries.

COMMON STOCKS AND BONDS AS INVESTMENTS 1913–35 AND 1923–35

Tests No. 1–7 extend from the beginning of 1913 to the end of 1935. It is the opinion of the writer that this period slightly favors bonds. Test No. 1, which compares railroad stocks with railroad bonds, shows that the bonds were a better investment than the stocks from 1913 to 1935. Test No. 2, which compares industrial stocks with industrial bonds, shows that the stocks were a better investment than the bonds. Test No. 3, which compares public utility stocks with public utility bonds, also shows that the stocks were a better investment than the bonds. When all the stocks and bonds used in Tests No. 1, 2, and 3 were combined into a single test, the stocks were a better investment than the bonds in spite of the fact that over 50 per cent of the companies represented were railroad companies and in spite of the fact that the period covered by the test appears to favor bonds.

Tests No. 4, 5, 6, and 7 would seem to indicate that since the beginning of 1913 high-grade railroad common stocks have been a slightly better long-term investment than high-grade railroad bonds and that speculative railroad common stocks have been a somewhat poorer long-term investment than speculative railroad bonds.

Six of the nine tests that cover the period from 1923 to 1935, that is, Tests No. 8–16, show that bonds were better investments than stocks. But, since the period covered by these tests is relatively short, and since it unquestionably favors bonds, the results of these tests in no way refute the theory that common stocks are in general a better long-term investment than bonds.

If all the 128 individual stock investments in the 16 tests had been combined into a single stock average and all the 128 individual bond investments into a single bond average, the stocks would

have been a better investment than the bonds. Since the companies that issued these securities represent most of the companies that had both stocks and bonds listed on the New York Stock Exchange from 1913 to 1935, it seems that the following conclusion is warranted: Since the beginning of 1913 the common stocks of the railroad, industrial, and public utility companies that had both stocks and bonds listed on the New York Stock Exchange have been in the aggregate a better long-term investment than the bonds of the companies.

COMMON STOCKS AS INVESTMENTS 1913–35 AND 1923–35

A study of Charts I–IV indicates that the following generalizations are valid for the stocks of those companies which had both stocks and bonds listed on the New York Stock Exchange from 1913 to 1935:

First, during periods of rising wholesale commodity prices industrial stocks tend to be a better investment than either railroad or public utility stocks. The reason for this is that rising wholesale commodity prices give industrial companies a temporary advantage over railroad and public utility companies, since changes in railroad and public utility rates tend to lag behind changes in wholesale commodity prices. But because the volume of business done by public utilities fluctuates less than the volume of business done by industrials, it is conceivable that, if a period of rising commodity prices was accompanied by decreasing business activity, public utility companies might be more successful than industrial companies, and, consequently, public utility stocks might be a better investment than industrial stocks.

Second, during periods of falling wholesale commodity prices both railroad and public utility stocks tend to be better investments than industrial stocks. The reason for this is that falling wholesale commodity prices give railroad and public utility companies a temporary advantage over industrial companies, since changes in railroad and public utility rates tend to lag behind changes in wholesale commodity prices. However, because of the fact that railroads are not able to make rapid reductions in operat-

ing expenses during periods of business recession and because of their large fixed charges, they may be even less successful than industrial companies during a period of falling commodity prices if this period of falling prices is accompanied by decreasing business activity. Under these conditions one would expect railroad stocks to be a poorer investment than industrial stocks.

Third, railroad stocks are more speculative than public utility stocks. The principal reason for this is that the volume of business done by railroads fluctuates more widely than the volume of business done by public utilities. This makes possible a greater variation of earnings for railroads than for public utilities.

Fourth, railroad stocks are more speculative than industrial stocks. One reason for this is the large fixed charges of the railroads, which magnify both profits and losses. Another reason is the difficulty that railroad companies have in reducing operating expenses during periods of business recession.

Fifth, public utility stocks are better investments than either railroad or industrial stocks during periods of business recession. The main reason for this is that the volume of business done by public utilities decreases less during a period of business recession than the volume of business done by either railroads or industrials. If a business recession were to occur during a period of rapidly rising commodity prices, however, industrial stocks might be a better investment than public utility stocks, owing to the temporary advantage given industrial stocks by the rising prices.

The industrial stocks illustrated on Chart I were a better investment than public utility stocks during the period from 1913 to 1935. But this by no means proves that industrial stocks are better long-term investments than public utility stocks. In the first place, the number of stocks used in the industrial- and public utility–stock averages was too small to be reliable; and, in the second place, it would seem that the period from 1913 to 1935 favors industrial stocks over public utility stocks, since wholesale commodity prices were somewhat higher in 1935 than in 1913. The unusually low yields made by the railroad stocks, however, from 1913 to 1935, would seem to leave no doubt that during the period covered by this study both industrial and public utility

stocks have been better investments than railroad stocks. At least this is true for the particular stocks studied.

The high-grade and speculative railroad stocks compared in Charts V and VI show that during periods in which railroad companies were unusually successful, speculative stocks were better investments than high-grade stocks; and that during periods in which railroad companies were unusually unsuccessful, high-grade stocks were better investments than speculative stocks. For the whole period from 1913 to 1935 high-grade stocks were a better investment than speculative stocks. Even taking into account the fact that the period under consideration appears to favor high-grade stocks, it would seem that high-grade stocks have been a somewhat better long-term investment than speculative stocks. If it could be definitely established, however, that high-grade railroad stocks are a better long-term investment than speculative railroad stocks, this would by no means prove that high-grade stocks in general and in the aggregate are a better long-term investment than speculative stocks. The railroad industry has been for some time on the downgrade financially, and it follows that in such an industry speculative stocks would be a poorer investment than high-grade stocks. On the other hand, it is possible that in the aggregate speculative stocks in a young and growing industry might not be a bad long-term investment. There does not seem to be sufficient evidence at hand to establish the assumption so frequently made that high-grade stocks are a better long-term investment than speculative stocks. It is conceivable that speculative stocks, at least certain types of speculative stocks, might be a better long-term investment than high-grade stocks. At least no one has as yet proved that they are inferior.

There seem to be at least three reasons why the public utility stocks were a better investment than the railroad stocks during the period from 1913 to 1935: first, public utility commissions have, as a general rule, been more liberal than the Interstate Commerce Commission in granting rates; second, railroads have experienced more competition than public utilities; and, third, this period has been one of rapid growth and expansion for most types of public utilities, while railroads reached the peak of their growth

and expansion some time before 1913. Perhaps the principal reason why industrial stocks were a good investment from 1913 to 1935 is that high industrial activity prevailed during a large portion of this period.

BONDS AS INVESTMENTS: 1913–35 AND 1923–35

Charts VII–X compare railroad, industrial, and public utility bonds as to investment value. In all the comparisons the industrial and public utility bonds were purchased on higher yield bases and on higher current-income bases than the railroad bonds. Since the industrial and public utility bonds were purchased on higher current-income bases than the railroad bonds and since in all cases they lost less through defaults in interest than the railroad bonds, it follows that in all four comparisons the interest income actually received on the industrial and public utility bonds was relatively greater than that received on the railroad bonds.

In addition to interest income, another factor which helped determine the relative investment value of the different types of bonds was appreciation or depreciation of bond principal. Gains or losses from appreciation or depreciation of bond principal arose principally through two sources: first, from changes in risk and, second, from changes in the pure interest rate. It would seem that when stocks and bonds are issued by the same companies, change in stock prices is a fair inverse index of the risk assumed in owning the bonds. At least this appears to have been true for the particular securities used in this study during the periods covered by the several tests. The results of these tests will show: first, whenever the stocks used in a given test increased in value at a more rapid rate than the stocks used in any other test, it usually happened that the bonds used in the former test appreciated at a more rapid rate or depreciated at a less rapid rate than the bonds used in the latter test; and, second, whenever the stocks used in a given test decreased in value at a more rapid rate than the stocks used in any other test, it usually happened that the bonds used in the former test appreciated at a less rapid rate or depreciated at a more rapid rate than the bonds used in the latter test. This may help to explain why in all four comparisons involving railroad, industrial,

and public utility bonds the final yields at the end of 1935 show that the railroad bonds lost through depreciation while both the industrial and public utility bonds gained through appreciation. The reason why bonds did not always increase in value when stocks issued by the same companies increased in value or why bonds did not always decrease in value when stocks issued by the same companies decreased in value was that risk and the pure interest rate did not always combine to change bond prices.

The industrial bonds illustrated in Chart VII were a better investment than public utility bonds from 1913 to 1935. This is not conclusive evidence that industrial bonds are, or that they have been, better long-term investments than public utility bonds. In the first place, the bonds used in this comparison may not be truly representative of industrial or public utility bonds in general; and, in the second place, the period from 1913 to 1935 may favor industrial bonds over public utility bonds, since it ends with several years of rising commodity prices.

Chart VII shows that from 1913 to 1935 both the industrial and the public utility bonds were better investments than the railroad bonds. The chart shows further that during this period railroad bonds were poor investments; at least they were poor in comparison with industrial and public utility bonds. Since such a large percentage of the railroad mileage in the United States is represented by the railroad bonds used in the present study, it would seem that one would be justified in saying that railroad bonds in general have been poor long-term investments since 1913. The main reasons why industrial and public utility bonds used in this study were better long-term investments than railroad bonds are: first, the industrial and public utility bonds were purchased on higher yield and higher current-income bases than the railroad bonds; second, the industrial and public utility bonds lost less through defaults in interest than the railroad bonds; and, third, the industrial and public utility bonds gained through appreciation while the railroad bonds lost through depreciation. The reasons why industrial and public utility bonds lost less through defaults in interest than railroad bonds and the reason why they gained from appreciation while railroad bonds lost through de-

preciation was because industrial and public utility companies, at least the ones represented in the present study, have been more successful than railroad companies since the beginning of 1913.

Charts XI and XII show that for the whole period from the beginning of 1913 to the end of 1935 high-grade railroad bonds were a slightly better investment than speculative railroad bonds. High-grade railroad bonds lost practically nothing from defaults in interest and just about maintained their principal intact. On the other hand, speculative railroad bonds which were purchased on a current-income basis about ½ per cent higher than the high-grade railroad bonds suffered considerable loss through defaults in interest and also lost through depreciation. Since speculative railroad bonds were only a slightly poorer investment at the end of 1935 than high-grade railroad bonds and since the period extending from 1913 to 1935 seems to favor high-grade bonds over speculative bonds, one would perhaps be justified in saying that since the beginning of 1913 high-grade and speculative railroad bonds have been about equal as long-term investments. The fact that speculative railroad bonds were only a slightly poorer investment than high-grade railroad bonds from 1913 to 1935, during a period in which the railroad industry was very unsuccessful, suggests that during the same period speculative bonds of companies in more successful industries might have been better investments than high-grade bonds. The unusually high yields at the end of 1935 on industrial and public utility bonds, illustrated on Charts VII–X, seem to indicate that the speculative industrial and public utility bonds used in this study were better long-term investments than the high-grade industrial and public utility bonds.

THE NEED FOR SCIENTIFIC STUDY

In spite of the numerous investment studies that have attempted to determine the long-term value of different types of securities, the problem of long-term security values has not as yet been approached in a truly scientific manner. Not only has the number of securities used in the investment averages, especially stock averages, been too small in most cases to give reliable results, but frequently entirely dissimilar securities have been grouped together

in averages as though these securities were homogeneous. For example, speculative railroad stocks do not behave like high-grade railroad stocks; yet it has sometimes been assumed that one railroad-stock average should produce about the same results as any other railroad-stock average regardless of what percentage of the securities were speculative or high grade. In utility-stock averages the fact has been almost entirely ignored that whether the average shows a high yield or a low yield depends to a large extent upon how few or how many street-railway stocks are included in the average. Considering the thousands of different types of industrial stocks, it is evident that an average of ten, picked at random from this number, is meaningless.

A scientific investment study would involve an analysis of the aggregate investment value of different elementary types of securities. For example, let us assume that an investment study is to be made to determine the long-term investment value of the securities listed on the New York Stock Exchange between two given dates. The first step in the study would be to construct investment relatives for each of the listed securities for each of the years in which quotations are available. Next, in order to determine the investment value in the aggregate of each of the elementary types of securities, all homogeneous securities would be grouped and averages made of their investment relatives. Homogeneous securities would consist in the case of railroads not of railroad stocks and bonds as such but of high-grade, second-grade, and speculative railroad stocks and bonds; or the classification might be in terms of size of company or some other basis of classification.

Public utility companies would be classified first according to type of service rendered. Then the stocks and bonds of each of these different types of companies would be subdivided into elementary security types according to a number of different bases of classification, such as risk assumed in owning the securities, size of company, etc. The number of separate types of industrial stocks and bonds would of course be almost unlimited. It should be mentioned at this time that, because of the fact that many companies render more than one type of service, dividing the companies ac-

cording to the type of service rendered might not be an easy task. A careful study of the types of service rendered by different companies, however, should enable one to classify the stocks and bonds to be used in the averages into more logical groupings than have been made in the past.

THE COMMON STOCK THEORY IN THE FUTURE

Although the Common Stock Theory has never been proved, all evidence that we have indicates that it has held true in the past. Will this theory hold true in the future? Edgar Lawrence Smith based his proof of the Common Stock Theory upon the contention that common stocks are not inferior to bonds as investments during long-term periods of falling commodity prices. From the end of the Civil War until about the year 1929 this country passed through a period of marked industrial expansion. During such a period one might expect to find common stocks equal to bonds as investments even during periods of falling commodity prices. But what of the future? Some believe that the era of marked industrial expansion in the United States is at an end, that we are now entering a period of business stability with declining business profits. It has been suggested that the Common Stock Theory may not hold true in the future if a new period of falling prices develops.[1]

There are at the present time certain factors which indicate that corporate earnings may not be as great in the future as they have been in the past. One of these factors is a possible stationary population for the United States in the near future. Another factor is the trend in recent years toward self-sufficiency among many different nations. Other factors are increasing wages and higher taxes. In so far as these and other factors restrict markets for American-made goods and thus affect what has been called the normal growth of American industry, they may reduce earnings of American corporations. But, on the other hand, it is hard to see how in the near future, at least, bondholders will have much opportunity to break even or to gain on stockholders during periods

[1] C. H. Whelden, Jr., "Common Stocks and Falling Commodity Prices," *Barron's*, July 7, 1930, pp. 12, 13.

of falling commodity prices. With the national debt as large as it is and continually growing larger, with the art of devaluation rediscovered during the recent depression, it does not seem likely that there will be any long-term periods of falling prices for years to come. It is the opinion of the writer that the Common Stock Theory has held true in the past and that it will hold true in the future.

STOCKS AND BONDS AS INVESTMENTS SINCE 1935

The sixteen tests of the present study ended December 31, 1935. If these tests had been extended to the present time, would the relative investment values of the different types of securities have remained unchanged? Of course the best way to answer this question would be to bring the tests up to date. But this would require a great deal of work. It was decided, therefore, to attempt to answer the question stated above by means of a short-cut method. This method involved the making of two assumptions which it is hoped are at least approximately correct. The first of these assumptions is that price changes in the securities used in the several tests were proportional to changes in the corresponding Dow-Jones and Standard Statistics daily security price averages The second assumption is that dividends received on the stocks used in the tests were proportional to interest received on the bonds. This second assumption made it possible to disregard income in calculating the stock and bond indexes. Since no additions were made for dividends or interest, the stock and bond indexes as computed for July 1, 1940, represent the relative worth of stocks and bonds at this date, but they do not represent actual values. Stock and bond indexes were computed for only the first five of the sixteen tests.

Table 18 shows stock and bond indexes computed as of July 1, 1940, for Tests No. 1, 2, 3, 4, and 5 of the present study. These indexes were computed by adjusting the unadjusted indexes of Tests No. 1–5 as of the end of the year 1935 in accordance with changes that took place in the Dow-Jones daily stock price averages and the Standard Statistics daily stock price indexes between December 31, 1935, and July 1, 1940.

One glance at the table will show that the case for common stocks is not nearly so good upon July 1, 1940, as it was on December 31, 1935. The railroad stocks in Tests No. 1, 4, and 5 are definitely poorer investments than the railroad bonds. Even the utility stocks in Test No. 3 are somewhat poorer than the utility bonds. The industrial stocks of Test No. 2, however, still lead the industrial bonds by a good margin. Do the tests of the present study still confirm the Common Stock Theory upon July 1, 1940?

TABLE 18

STOCK AND BOND INDEXES: JULY 1, 1940

Test	Computed by Means of Dow-Jones Averages		Computed by Means of Standard Statistics Indexes	
	Stocks	Bonds	Stocks	Bonds
1.....	1.113	1.837	1.036	1.638
2.....	7.056	4.759	6.199	4.443
3.....	3.214	3.667	3.116	3.459
4.....	1.558	2.111	1.478	1.641
5.....	1.605	2.169	1.494	1.686

The answer is yes. If at the present time the securities of Tests No. 2, 3, 4, and 5 were combined into a single test, the stocks would still be a somewhat better investment than the bonds. That is, they would be if our short-cut method of calculation is correct. Are the findings of the present chapter sufficient to cause us to revise our ideas in regard to the long-term superiority of high-grade stocks over high-grade bonds? It would seem not. It is true that stock prices have declined since 1935, but since this date new forces have also appeared which forecast rising commodity prices. No critic of the Common Stock Theory has yet been found who believes that high-grade bonds are better investments than high-grade stocks during a period of rising commodity prices.

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[PRINTED IN U.S.A.]